AD-A151 997 COMPUTERIZED PRODUCTION PROCESS PLANNING VOLUME 3 APPENDICES A B AND C TO BENEFIT ANALYSIS(U) IIT RESEARCH INST CHICAGO IL H H SHU ET AL. NOV 76 1/4

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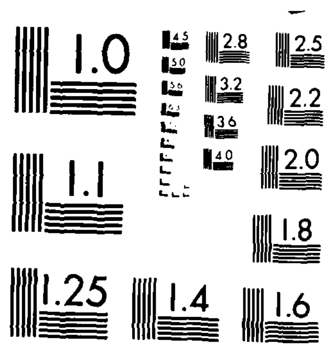

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Manufacturing Methods and Technology

AD-A151 997

COMPUTERIZED PRODUCTION PROCESS PLANNING

VOLUME III APPENDICES A, B, AND C TO BENEFIT ANALYSIS

Interim Report

November, 1976

Hsien-Hwei H. Shu

Janis C. Church

Jack P. Kornfeld

U.S. Army Missile Command
Contract No. DAAH01-76-C-1104

Prepared by: IIT Research Institute
Chicago, Illinois 60616

For: United Technologies Research Center
East Hartford, Ct 06108

IITRI

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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO. AD-A151 997	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Computerized Production Process Planning Volume III - Appendices A, B, and C of Benefit Analysis		5. TYPE OF REPORT & PERIOD COVERED Interim Technical Report 30 Jun 76 - 30 Nov 76
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Hsien-Hwei Hunter Shu, Janis C. Church, Jack P. Kornfield		8. CONTRACT OR GRANT NUMBER(s) DAAH01-76-C-1104
9. PERFORMING ORGANIZATION NAME AND ADDRESS IIT Research Institute, 10 West 35th Street, Chicago, Illinois 60616		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS U.S. Army Missile Command, Redstone Arsenal, Alabama 35809		12. REPORT DATE November, 1976
		13. NUMBER OF PAGES 366
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Computer-aided manufacturing
Computerized production process planning
Computer applications
Production Process Planning
Process planning
Benefit analysis
Cost reduction

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Presents data collected, using industry survey, on process planning methods, related costs, and benefits of computerized production process planning.

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APPENDIX A - DATA REQUEST

This appendix contains the data request which was mailed to 153 individuals in various manufacturing companies and divisions. The criteria for selecting the addresses were that each Army missile prime contractor should receive a data request and individuals known to be knowledgeable in the subject matter should also be solicited for information. Individuals meeting these criteria were identified from a variety of sources: a list of participants in the Army's Missile Manufacturing Technology Conference; attendance lists for CAM-I's meetings on process planning and the Air Force's meetings on AFCAM and I-CAM; lists of respondees for similar surveys; and, individuals suggested by UTRC, IITRI staff and other people contacted during the project.

A breakdown of the mailing by industry type is as follows:

Missile Prime Contractors	10
Missile Subcontractors	4
Other Aerospace Companies	37
Other Types of Manufacturers	102
	153

The data request consists of three major sections. The first section describes the purpose of the project, explains the function of the data request and provides definitions of process planning and other terminology needed to complete the form. The second section requests information which characterizes the company, its process planning methods, and other relevant

parameters -- company size, type of products, product similarity, batch sizes, current usage of computers in process planning, process planning costs, machinery costs, tooling costs, etc. In the third section, three levels of process planning automation are described, and each addressee was asked to estimate their benefits, implementation costs, operation and maintenance costs, and obstacles to implementation for each level of planning automation. Also included with each data request was a reprint of an article from N/C Commline (Vol. 5, No. 3, June/July, 1976) which contained a description of UTRC's approach to computer aided process planning.

Responses to the data request served as the major source of information for the cost/benefit analysis contained in Volume I of this report. Twenty-one responses were received, although all were not completely filled out. This represents a response rate of 13.7%, an unusually high number for a survey of this type and breadth.

The data request is presented on the following pages and the responses are presented in Appendix B.

IIT Research Institute
10 West 35 Street Chicago, Illinois 60616
312/567-4000

COMPUTER AIDED PROCESS PLANNING
OF MACHINED PARTS

IIT Research Institute is attempting to identify the potential impact of computer aided production process planning for discrete machined parts and to perform cost benefit analyses of various degrees of process planning automation. Hopefully, one of the outcomes of this study will be an indication of the direction and degree to which the development of computer aids should be supported.

This study is sponsored by the U.S. Army Missile Command and is part of a larger project to develop and demonstrate a prototype computer aided process planning system. The development and demonstration of the prototype system is being done by United Technologies Research Center, East Hartford, Connecticut. A brief description of United Technologies' approach to computer aided process planning is contained in the enclosed article reprinted from N/C Commline.

We are asking you to help us in this endeavor by describing in general terms your products and facilities, your current process planning procedures and your estimate of the impact computer aided process planning has or would have on your operation.

In order to complete our study within the allotted time, we request that you complete the attached form and return it by September 3, 1976. The results of the study will be provided to those individuals who submit data.

We will consider all data proprietary and will summarize or consolidate the information so that the source of specific items cannot be identified. We appreciate your assistance and welcome any information which you can give us.

INTRODUCTION

This form is broken into two sections. In the first section we are requesting information which will enable us to quantify the costs of process planning for discrete machined parts, to assess the current usage of computer aids in process planning, and to analyze the factors which may impact whether or not a company would implement a computer aided process planning system. In the second section we have described several hypothetical computer aided process planning systems and are requesting that you estimate the impact these systems would have on your company.

However, before proceeding further, it is necessary to provide you with several definitions so that you have an understanding of what we mean when we use terms like "machined parts" and "process planning".

MACHINED PARTS: For the purposes of this study, machined parts are defined as those parts for which the primary manufacturing operations include milling, turning, boring, drilling, grinding, hobbing, etc. Machined parts do not include those parts for which the primary manufacturing operations are stamping, forming, welding, etc., nor does it include assemblies.

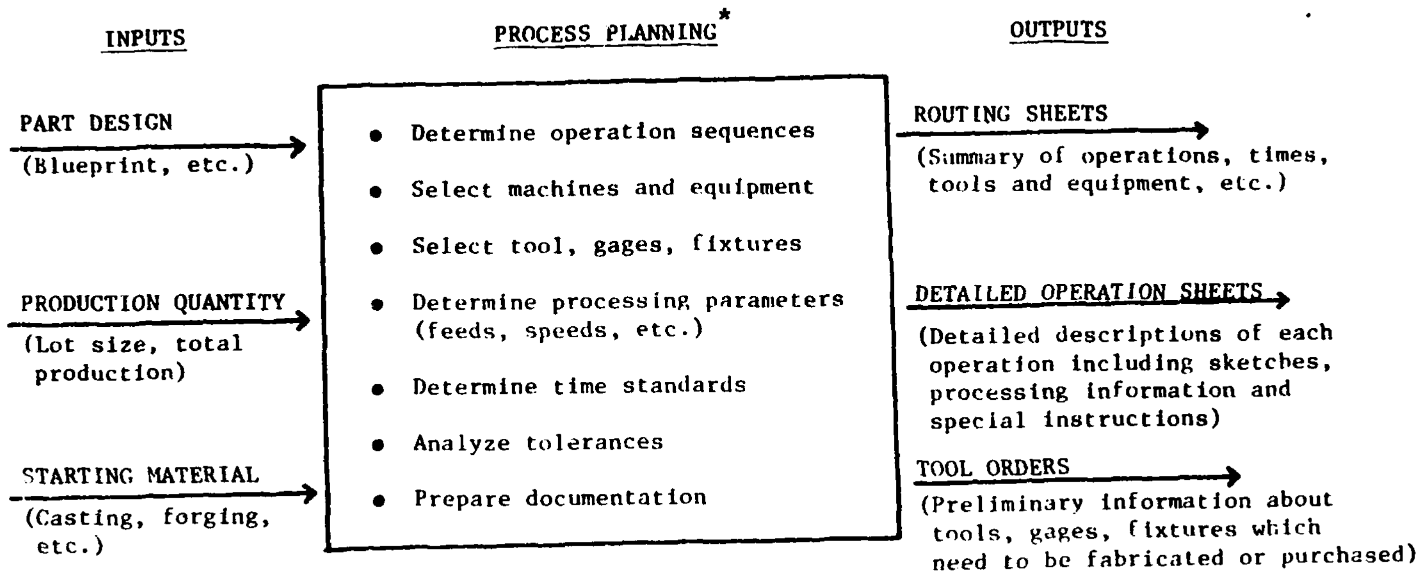
CYLINDRICAL MACHINED PARTS: For the purposes of this study, cylindrical machined parts are those for which the major features of the part are symmetrical about an axis of rotation and the primary manufacturing operations are turning, boring, etc. Examples of cylindrical machined parts include shafts, sleeves, pistons, etc.

NON-CYLINDRICAL MACHINED PARTS: For the purposes of this study, non-cylindrical machined parts are those for which the major features of the part are not symmetrical about an axis of rotation. Examples of non-cylindrical machined parts include engine blocks, pump housings, etc.

PROCESS PLANNING: Process planning is basically the conversion of part design information into the "how-to" information needed to manufacture the part. The inputs, outputs, and major functions of process planning are shown in Figure 1.

The process planner starts with information about the part design, the quantity of the part to be produced and the starting material the part will be made from. The process planner then performs the following types of tasks:

- Determination of operations and sequences.
- Selection of machines and equipment needed to perform the operations.
- Selection of appropriate tools, gages, and fixtures.
- Determination of processing parameters (speeds, feeds, cutter paths, etc.) for each operation.



* As defined here, process planning does not include NC part programming, production scheduling, planning and scheduling of material handling, tool design or plant layout.

Fig. 1. - Diagram of Process Planning

- Determination of time standards.

- Analysis of tolerances.

- Preparation of routing sheets which summarize the operations to be performed, the times required for each operation and the tooling and equipment needed.

- Preparation of detailed operation sheets which describe each operation, including sketches of the workpiece, identification of tools, fixtures, etc., tool layout and parts clamping, speeds and feeds, and special instructions for inspection, cleaning, etc.

- Preparation of tool orders for jigs, fixtures, gages, etc., which need to be fabricated or purchases.

Process planning, as we have defined it, does not include production scheduling, tool design, NC part programming or plant layout.

We recognize that our definition of process planning may not coincide with yours and that several of the tasks mentioned above may be performed by people who are not called "process planners". However, it was necessary to draw a boundary around process planning so that there will be some uniformity in the responses we receive.

Please read each question carefully before answering it. We realize that some of the information we are requesting will not be readily available. If you are unable to obtain the information we ask that you give us the best estimate that you can.

Occasionally companies have data available which do not fit the categories as we have defined them or which relate to production process planning in other areas (sheet metal fabrication, for example). In these cases, we would appreciate any data you could provide us regardless of form.

If you have any questions or need additional information, please feel free to call (collect) Dr. Hunter Shu (312/567-4615) or Mr. Jack Kornfeld (312/567-4635) at IITRI.

SECTION I - GENERAL INFORMATION

1. What types of products are manufactured at your location?

   ____

2. Please estimate the total number of employees at your location.

   __________#

3. What is the approximate dollar value of products shipped from your plant annually?

   $__________

4. What percentage of that value would you estimate represents cylindrical and non-cylindrical machined parts (even if they were part of an assembly or finished product)?

   Cylindrical Machined Parts __________%

   Non-Cylindrical Machined Parts __________%

5. If you purchase machined parts from outside sources, what would you estimate are the annual dollar values of your purchases?

   Cylindrical Machined Parts $__________

   Non-Cylindrical Machined Parts $__________

6. Approximately how many different machined parts are manufactured in your plant each year? (By "different", we mean different part numbers rather than serial numbers or total volume).

   Cylindrical Machined Parts __________#

   Non-Cylindrical Machined Parts __________#

7. Approximately how many new machined parts (new part numbers) are introduced into your plant each year?

   Cylindrical Machined Parts __________#

   Non-Cylindrical Machined Parts __________#

8. What is the approximate total volume of machined parts manufactured in your plant each year?

   Cylindrical Machined Parts __________#

   Non-Cylindrical Machined Parts __________#

9. Considering the total number of batches or production runs you make each year for machined parts, what percentage are batches of less than 100 units, batches of 100-1000 units, and batches of over 1000 units?

Batch Size	Cylindrical Machined Parts	Non-Cylindrical Machined Parts
1-100	________%	________%
100-1000	________%	________%
over 1000	________%	________%
	100%	100%

10. Considering the number of batches made for each machined part during a year, what percentage of the parts only have 1 batch made per year, 2 to 10 batches, and over 10 batches?

No. of Batches/Year	Cylindrical Machined Parts	Non-Cylindrical Machined Parts
1	________%	________%
2-10	________%	________%
Over 10	________%	________%
	100%	100%

11. Please estimate the percentage of machined parts manufactured in your plant which have less than 10 operation numbers per process plan, 10 to 25 operation numbers, and more than 25 operation numbers.

No. of Operations	Cylindrical Machined Parts	Non-Cylindrical Machined Parts
1-10	________%	________%
10-25	________%	________%
more than 25	________%	________%
	100%	100%

33. **Assuming that reliable software, good user documentation, and a training source were available for the system, please estimate what you feel would be realistic costs and times if your company installed and maintained such a system for machined parts. (You may attach additional sheets containing assumptions and calculations if you like.)**

System Implementation:

	Cylindrical Machined Parts		Non-Cylindrical Machined Parts	
	Cost ($)	Time (Months)	Cost ($)	Time (Months)
• Hardware (if necessary)				
• Establish initial data files				
• Train personnel				
• Test system				
• Other (Please specify) ______				
______				

System Maintenance

	Cylindrical Machined Parts	Non-Cylindrical Machined Parts
	Cost ($/Year)	Cost ($/Year)
• Computer charges and program maintenance		
• Updating of data files		
• Other (Please specify) ______		
______		

34. Please list what you feel would be major obstacles to implementing such a system.

______

______

______

______

31. Assuming such a system is operating in your plant, please indicate a percentage increase or decrease in the following cost areas over manual process planning for machined parts. (You may specify a range, but please keep it as narrow as possible.)

	Cylindrical Machined Parts		Non-Cylindrical Machined Parts	
Process Planning		____%		____%
Determining Operation Sequences	(____%)		(____%)	
Machine/Equipment Selection	(____%)		(____%)	
Tool Selection	(____%)		(____%)	
Determining Processing Parameters	(____%)		(____%)	
Generating Time Standards	(____%)		(____%)	
Performing Tolerance Analyses	(____%)		(____%)	
Preparing Documentation	(____%)		(____%)	
Material		____%		____%
Direct Labor		____%		____%
Scrap and Rework		____%		____%
Tooling		____%		____%
Work-in-Process Inventory		____%		____%
Other (Please specify)		____%		____%

32. Considering a scale of +2 to -2, where +2 = significant improvement, +1 = slight improvement, 0 = no change, -1 = slightly negative impact and -2 = significantly negative impact, please indicate the impact such a system would have over manual process planning methods by putting the appropriate number next to each item listed below.

	Impact		Impact
Production Leadtime	____	Critical Labor Skills	____
Process Planning Leadtime	____	Raw Material Standardization	____
Machine Utilization	____	Producibility of Parts	____
Product Quality	____	Plant Layout	____
Direct Labor Utilization	____	Material Handling	____
Uniformity of process plans	____	Production Scheduling	____
Cost Estimating Procedures	____	Capacity Planning	____
Make/Buy Decisions	____	Others (Please specify)	____
Product Standardization	____	____________________	____

specify details of a particular operation or if the data bases are incomplete and the system needs inputs from him to proceed. The final process plan, including routing sheets and detailed operation sheets is then stored in the data for future use.

3. A process planner can also use the system to retrieve and to modify process plans which have been previously generated and stored in the data base.

In summary, at this level of automation, the computer may be used not only for the retrieval and up-dating of existing process plans, but also is capable of generating a feasible, efficient process plan by using internally stored data and logic.

System 3

Semi-Automatic System with Computer-Aided Operation Determination

This system is considerably different from the previous system in several respects. One of the major differences is that this system has a "generative" process planning capability in that it contains a certain degree of decision logic concerning process planning, thereby enabling the system to produce most or all of the process planning without relying on the existence of a standard process plan or a process plan for a similar part (although this system could also operate in the same mode as the previous system if desired).

The main features of this system are described below.

1. The system has the following data bases:

   a) A machine/equipment data base which contains information concerning a machine's physical characteristics, cutting capabilities, tolerance ratings and operating costs.

   b) A tooling data base which contains information on tool geometry, material, application and cost.

   c) A machinability data base which contains information on speeds, feeds, tool life, etc. This data base has two parts, one for "look-up" data on machinability, and one for machinability equations which are used to "optimize" processing parameters.

   d) A data base containing process decision rules which provide the system with the logic needed to generate process plans. In general, these rules would be developed from past experience in your plant.

   e) Stored process plans for previously planned parts.

2. In operation of the system, a process planner would sit down at a CRT terminal and input data on the machined part design (e.g., geometry, tolerances, surface finish, hardness, concentricity, etc.), the starting material (e.g., type, geometry, etc.) and the lot size. The computer system would then generate a process plan using the process decision rules to select the machine or equipment type, select tooling and fixtures, and determine "optimum" machine/tool path combinations for each metal removal operation. The system also calculates time standards, inserts operations for heat treating, cleaning, inspection, etc., and produces sketches of the workpiece and tooling suitable for inclusion in the operation sheets. The process planner can interact with the system if he wishes to override the decision logic and

29. **Assuming that reliable software, good user documentation, and a training source were available for the system, please estimate what you feel would be realistic costs and times if your company installed and maintained such a system for machined parts. (You may attach additional sheets containing assumptions and calculations if you like.)**

System Implementation:	Cylindrical Machined Parts		Non-Cylindrical Machined Parts	
	Cost ($)	Time (Months)	Cost ($)	Time (Months)
• Hardware (if necessary)				
• Establish initial data files				
• Train personnel				
• Test system				
• Other (Please specify) ____________				
____________________________				

System Maintenance	Cylindrical Machined Parts	Non-Cylindrical Machined Parts
	Cost ($/Year)	Cost ($/Year)
• Computer charges and program maintenance		
• Updating of data files		
• Other (Please specify) ____________		
____________________________		

30. **Please list what you feel would be major obstacles to implementing such a system.**

____

____

____

____

27. Assuming such a system is operating in your plant, please indicate a percentage increase or decrease in the following cost areas over manual process planning for machined parts. (You may specify a range, but please keep it as narrow as possible.)

	Cylindrical Machined Parts	Non-Cylindrical Machined Parts
Process Planning	_____%	_____%
Determining Operation Sequences	(_____%)	(_____%)
Machine/Equipment Selection	(_____%)	(_____%)
Tool Selection	(_____%)	(_____%)
Determining Processing Parameters	(_____%)	(_____%)
Generating Time Standards	(_____%)	(_____%)
Performing Tolerance Analyses	(_____%)	(_____%)
Preparing Documentation	(_____%)	(_____%)
Material	_____%	_____%
Direct Labor	_____%	_____%
Scrap and Rework	_____%	_____%
Tooling	_____%	_____%
Work-in-Process Inventory	_____%	_____%
Other (Please specify)	_____%	_____%

28. Considering a scale of +2 to -2, where +2 = significant improvement, +1 = slight improvement, 0 = no change, -1 = slightly negative impact and -2 = significantly negative impact, please indicate the impact such a system would have over manual process planning methods by putting the appropriate number next to each item listed below.

	Impact		Impact
Production Leadtime	_____	Critical Labor Skills	_____
Process Planning Leadtime	_____	Raw Material Standardization	_____
Machine Utilization	_____	Producibility of Parts	_____
Product Quality	_____	Plant Layout	_____
Direct Labor Utilization	_____	Material Handling	_____
Uniformity of process plans	_____	Production Scheduling	_____
Cost Estimating Procedures	_____	Capacity Planning	_____
Make/Buy Decisions	_____	Others (Please specify)	_____
Product Standardization	_____	_____________________	_____

System 2

Interactive System with Computer-Aided Cutting Parameter Determination

This system is essentially the same as the previously described system except that it has been up-graded in the following areas:

1. A computerized database, in conjunction with appropriate database management software will allow the retrieval of:

   a) A list of parts belonging to the same part family (i.e., a list of all parts having the same Group Technology code).

   b) A skeletal (or standard) sequence of operations for a particular Group Technology code.

   c) A process plan for an existing part number.

2. An interactive graphics (CRT terminal) capability to enhance a skeletal sequence of operations retrieved by a Group Technology code or modify an existing process plan for a particular part number. The editing consists of:

   a) Entering or modifying production demand data (e.g., job no., lot size, etc.)

   b) Deleting and adding operations and associated data on a routine sheet.

   c) Detailed planning for any operation on an operation sheet.

3. The edited results are the inputs to cutting parameter determination subroutines. Typically, the best feeds and speeds of a material removal operation with known machine and tooling will be determined and the associated cutting time computed. Such determination may be through either a table look-up in a machinability database or an analysis of empirical equations for metal removal. These parameter values, as well as other processing parameter values (e.g., heat treating temperature and time, etc.), may be reviewed by the process planner and modified if desired.

4. The completed process plan is then stored in the database under its part number for future reference.

5. The computer is used in the generation of shop documents as described in the previous system.

At this level of automation, the computer is used to (a) assist in retrieving process plans that are closely related to the part in question; (b) fascilitate interactive editing (modifying and enriching) the retrieved process plan; (c) determine best metal cutting parameters and associated time; and (d) produce needed documents for shop use (excluding sketches, which must still be prepared manually).

25. **Assuming that reliable software, good user documentation, and a training source were available for the system, please estimate what you feel would be realistic costs and times if your company installed and maintained such a system for machined parts. (You may attach additional sheets containing assumptions and calculations if you like.)**

	Cylindrical Machined Parts		Non-Cylindrical Machined Parts	
System Implementation:	Cost ($)	Time (Months)	Cost ($)	Time (Months)
• **Hardware (if necessary)**				
• **Establish initial data files**				
• **Train personnel**				
• **Test system**				
• Other (Please specify) ______				
______				

	Cylindrical Machined Parts	Non-Cylindrical Machined Parts
System Maintenance	Cost ($/Year)	Cost ($/Year)
• Computer charges and program maintenance		
• Updating of data files		
• Other (Please specify) ______		
______		

26. **Please list what you feel would be major obstacles to implementing such a system.**

______

______

______

______

23. Assuming such a system is operating in your plant, please indicate a percentage increase or decrease in the following cost areas over manual process planning for machined parts. (You may specify a range, but please keep it as narrow as possible.)

	Cylindrical Machined Parts		Non-Cylindrical Machined Parts	
Process Planning		____%		____%
Determining Operation Sequences	(____%)		(____%)	
Machine/Equipment Selection	(____%)		(____%)	
Tool Selection	(____%)		(____%)	
Determining Processing Parameters	(____%)		(____%)	
Generating Time Standards	(____%)		(____%)	
Performing Tolerance Analyses	(____%)		(____%)	
Preparing Documentation	(____%)		(____%)	
Material		____%		____%
Direct Labor		____%		____%
Scrap and Rework		____%		____%
Tooling		____%		____%
Work-in-Process Inventory		____%		____%
Other (Please specify)		____%		____%

24. Considering a scale of +2 to -2, where +2 = significant improvement, +1 = slight improvement, 0 = no change, -1 = slightly negative impact and -2 = significantly negative impact, please indicate the impact such a system would have over manual process planning methods by putting the appropriate number next to each item listed below.

	Impact		Impact
Production Leadtime	____	Critical Labor Skills	____
Process Planning Leadtime	____	Raw Material Standardization	____
Machine Utilization	____	Producibility of Parts	____
Product Quality	____	Plant Layout	____
Direct Labor Utilization	____	Material Handling	____
Uniformity of process plans	____	Production Scheduling	____
Cost Estimating Procedures	____	Capacity Planning	____
Make/Buy Decisions	____	Others (Please specify)	____
Product Standardization	____	____________________	____

SECTION II - IMPACT OF COMPUTER AIDED PROCESS PLANNING

In this section, we briefly describe three types of computer aided process planning systems. Please read the description of each system and then estimate the savings such a system would provide over a manual system and the cost of implementing and maintaining such a system in your plant.

System 1

Computer-Aided Group Technology Code Management and Document Generation

At this level of automation, the process planner does pretty much what he used to do manually except in two respects:

1. Every machined part, distinguishable by its part number, is also assigned a Group Technology Code which characterizes the geometrics and machining requirements of various machined parts into part families. An experienced process planner may assign a G.T. code to a given part by inspection of the blueprint. Computer maintained Group Technology code data files, in the form of listings, are then examined to ascertain whether the process plan of a given part:

   a) is currently available;

   b) can be prepared by modifying an existing process plan for a similar part; or

   c) must be created from scratch because the part belongs to none of the known part families.

   The process planner will then take maximum advantage of the process information uncovered in his manual effort to produce a process plan for the part. The Group Technology code data files are up-dated periodically to reflect current availability of similar process plans.

2. Once the process plan of a given part is manually prepared, the machining and material processing steps may be coded into the computer (by keypunch operators working from a coding sheet) which, in turn, produces useful hard copy documents for the shops. These documents may be:

   a) Routing sheets containing a summary of the operations, machines and equipment needed, jigs/fixtures and cutter types, and standard times for each operation.

   b) Operation sheets containing detailed instructions for each operation such as cutter path, feeds, speeds and/or material processing parameters. If graphical aids are needed for these operations, these aids are manually generated.

At this level of automation, therefore, the process planner is (a) assisted in locating some process plan that is closely related to the part in question if such a plan exists and (b) relieved of much of the tedium of producing documents used in the production of the part.

18. Please estimate your average cost of preparing a process plan for each of the following categories. (Include costs for labor, material, reproduction, computer support, if appropriate, etc.) (See question 13.)

	Cylindrical Machined Parts	Non-Cylindrical Machined Parts
Prepare plan for a new part	$ ________	$ ________
Modify an existing plan	$ ________	$ ________
Prepare plan for study purposes	$ ________	$ ________

19. For the machined parts you manufacture in-house, please estimate the approximate percentages for the cost components listed below. (This information is quite important in analyzing the impact of computer aided process planning, so please be as accurate as possible.)

	Cylindrical Machined Parts	Non-Cylindrical Machined Parts
Material	________%	________%
Direct Labor (Wages + Fringe Benefits)	________%	________%
Tooling (Perishable + Amortized Non-perishable)	________%	________%
Scrap and Rework	________%	________%
Process Planning	________%	________%
Other (Overhead, Profit, etc.)	________%	________%
	100%	100%

20. Approximately what is the average value of work-in-process inventory for machined parts manufactured in your plant?

Cylindrical Machined Parts $________

Non-Cylindrical Machined Parts $________

21. Does your plant use computer assisted process planning and/or group technology for areas other than machined parts?

YES ☐ NO ☐

22. Has your company performed studies relating to process planning economics or the costs of manufacturing machined parts?

YES ☐ NO ☐

16. Please estimate the cost percentages for process planning of a typical new machined part to be manufactured in your plant.

PLANNING FUNCTION	Percent of Process Planning Costs	
	Cylindrical Machined Parts	Non-Cylindrical Machined Parts
• Determine operation sequences	_______%	_______%
• Select machines and equipment	_______%	_______%
• Select tooling, gages, etc.	_______%	_______%
• Determine processing parameters (speeds, feeds, etc.) (Please exclude NC part programming).	_______%	_______%
• Determine time standards	_______%	_______%
• Analyze tolerances	_______%	_______%
• Prepare routing sheets	_______%	_______%
• Prepare operations sheets	_______%	_______%
• Prepare tool orders	_______%	_______%
• Other (Please specify) _______________	_______%	_______%
	100%	100%

17. Please estimate the number of man-hours, cost and leadtime in days to prepare a typical process plan for a new machined part having the following number of operations. (Please exclude NC part programming.)

No. of Operations	Cylindrical Machined Parts			Non-Cylindrical Machined Parts		
	Man Hours	Cost ($)	Lead-time (Days)	Man Hours	Cost ($)	Lead-time (Days)
10						
25						
50						

14. We would like to know what process planning functions are performed in your plant for machined parts and what computer aids are available. Please place a check in the appropriate box if you are performing the function. If you are planning to implement computer techniques to assist in any of these functions within the next 2 years, please indicate by putting a "P" in the appropriate box.

PLANNING FUNCTIONS	MANUALLY	SOME AUTOMATION	FULLY AUTOMATED
	(Please check if currently performing function. Insert "P" is computer aids are planned.)		
• Determine operation sequences			
• Select machines and equipment			
• Select tooling, gages, etc.			
• Determine processing parameters (speeds, feeds, etc.) (Please exclude NC part programming.)			
• Determine time standards			
• Analyze tolerances			
• Prepare routing sheets			
• Prepare operations sheets			
• Prepare tool orders			
• Conduct design/ producibility reviews			
• Other (please specify)			
____________________			
____________________			

15. If you are currently using some form of computer assisted process planning for machined parts, what are the approximate annual maintenance and support costs? (Please exclude NC part programming.)

$____________

12. One of the factors influencing whether or not a company would implement a computer assisted process planning system may be the degree of similarity between the parts being manufactured. Part types or families which are basically similar from the standpoint of design characteristics and manufacturing processes required may be more suited to computer assisted process planning than parts which are totally different.

Keeping this in mind, please estimate what percentage of machined parts manufactured in your plant are: (1) basically similar and could be grouped into part families having more than 5 parts per family; (2) somewhat similar and could be grouped into parts families having between 2 and 5 parts per family; and (3) totally different.

	Cylindrical Machined Parts	Non-Cylindrical Machined Parts
Basically Similar (more than 5 parts per family)	______%	______%
Somewhat Similar (2-5 parts per family)	______%	______%
Totally Different	______%	______%
	100%	100%

13. Approximately how many process plans for machined parts are prepared annually in each of the following categories?

	Cylindrical Machined Parts	Non-Cylindrical Machined Parts
Process plans for new parts	______#	______#
Process plans for parts manufactured previously but which must be modified because of changes in part design or processing.	______#	______#
Process plans for analyses (Make/Buy studies, producibility studies, cost estimates, etc.)	______#	______#
Other (please specify) ______________	______#	______#
TOTAL	______#	______#

(If different from the attached label)

NAME_______________________________

TITLE______________________________

ORGANIZATION_______________________

ADDRESS____________________________

____

____

PHONE:______________________

Thank you for your cooperation. It is sincerely appreciated. Please return this form in the attached, self-addressed envelope to:

Dr. Hunter Shu
Scientific Advisor
Management & Computer Sciences Division
IIT Research Institute
10 West 35th Street
Chicago, Illinois 60616

APPENDIX B

RESULTS FROM DATA REQUEST

This appendix contains an analysis of the responses to the questions in the data survey.

A total of 21 data requests were filled out and returned to IITRI. By industry type, the responses were as follows:

Missile Prime and Subcontractors	4
Other Aerospace Companies	8
Other Types of Manufacturers	9
TOTAL	21

All of the data requests returned were not completely filled out. However, for most questions a majority of the responsees provided answers.

The approach used to analyze the data was to first develop a "spread sheet" containing columns for each data element. The data request had approximately 330 possible answers. In addition, the spread sheet was also used as a means of performing numerous intermediate calculations on the data as described in Appendix C. The intermediate calculations added to the number of columns bring the total to around 600.

The spread sheet was laid out on 14 large poster boards (approximately 3' x 4' each), and then rows were laid out corresponding to each data survey received.

Upon receipt of the data surveys, each was reviewed for consistency and completeness. Where obvious misunderstandings or inconsistencies were apparent, the respondee was contacted for clarification or the particular answer was considered a no response.

After the initial review of the data surveys, the data was manually entered onto the spread sheet and again checked for accuracy. Although this turned out to be a large effort, it paid off in the long-run because it displayed all of the data in a way that variations between responses and the interrelationships between columns could easily be assessed visually.

Once the data had been transferred to the spread sheets and was verified, the intermediate calculations described in Appendix C were then made for each data survey response. These calculations were then re-checked to assure accuracy.

Once these steps had been taken, the data for each column was fed into a computer program for analysis, The outputs from the computer analysis were the number of observations, means, standard deviations, minimum observations, maximum observations, and histograms for the data points. These were done by industry group and for the total number of responses.

The outputs from the computer program are contained in this appendix. Each page has a title which is keyed to a question number in the data request.

It should be pointed out that the scale on the horizontal axes of all histograms are in units of standard deviations from the mean for the total number of observations. Thus the histograms for the industry grouping are to the same scale as those for all responses and are not scaled in terms of standard deviations from the mean for the sub-groupings. By keeping the scaling for the subgroupings the same as for all responses, one is able to visually detect major shifts in subgroups from the total population.

In some cases, histograms were not appropriate as a means of representing the data and in those instances tabular summaries have been provided.

Some more advanced statistical analyses, such as regression and correlation analyses and scatter plots, were attempted but did not prove to be particularly meaningful. Because of resource constraints on the program, these approaches were not pursued further.

No attempt was made to determine confidence levels for the data because of the small sample size, the non-randomness in selecting the sample, the incompleteness of the data, and the wide variations in many of the answers received.

As far as the variations in the data are concerned, this can be attributed to many factors: the size of the company and the type of products; the current business trends the company was experiencing; differences between respondees in their interpretation of the terminology and questions; and, in some cases, a lack of concrete information which could be used as a basis for the response.

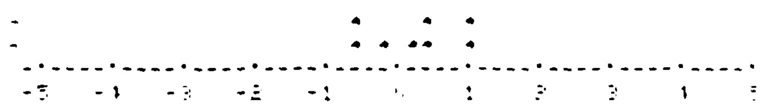
Q2 - TOTAL NUMBER OF EMPLOYEES

MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	2800
STD. DEV.	=	1857
MIN. OBS.	=	1000
MAX. OBS.	=	4500

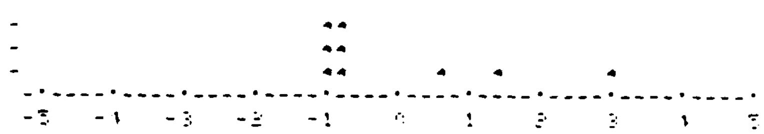
OTHER AEROSPACE

NO. OBS.	=	8
MEAN	=	5988
STD. DEV.	=	3233
MIN. OBS.	=	1800
MAX. OBS.	=	10000



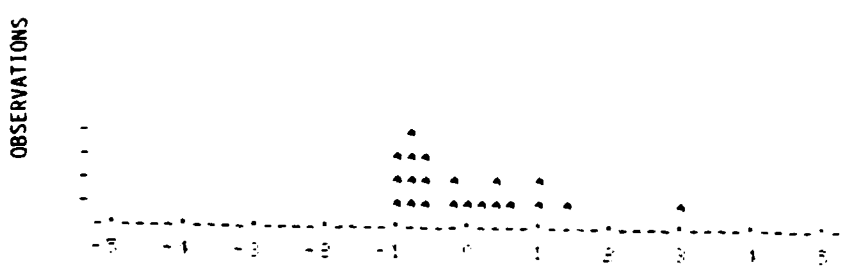
OTHER INDUSTRY

NO. OBS.	=	9
MEAN	=	4742
STD. DEV.	=	7010
MIN. OBS.	=	130
MAX. OBS.	=	19600



ALL RESPONSES

NO. OBS.	=	21
MIN. OBS.	=	130
MAX. OBS.	=	19600



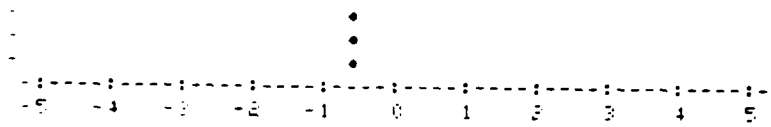
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 4847 STD. DEV. = 5019

Q3 - APPROXIMATE DOLLAR VALUE OF PRODUCTS SHIPPED ANNUALLY.

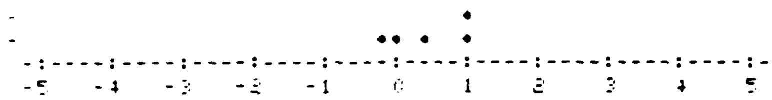
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = $50 mil.
STD. DEV. = $10 mil.
MIN. OBS. = $40 mil.
MAX. OBS. = $60 mil.



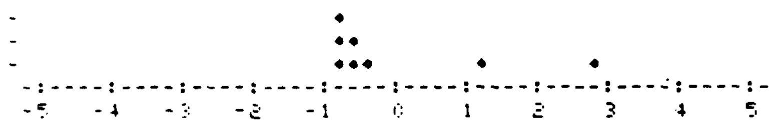
OTHER AEROSPACE

NO. OBS. = 5
MEAN = $268 mil.
STD. DEV. = $129 mil.
MIN. OBS. = $125 mil.
MAX. OBS. = $400 mil.



OTHER INDUSTRY

NO. OBS. = 8
MEAN = $178 mil.
STD. DEV. = $292 mil.
MIN. OBS. = $2 mil.
MAX. OBS. = $800 mil.



ALL RESPONSES

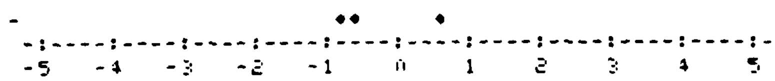
NO. OBS. = 16
MIN. OBS. = $2 mil.
MAX. OBS. = $800 mil.

STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $182 mil. STD. DEV. = $224 mil.

Q4 - PERCENTAGE OF VALUE OF PRODUCTS SHIPPED WHICH REPRESENTS CYLINDRICAL MACHINED PARTS
(EVEN IF THEY WERE PART OF AN ASSEMBLY OR FINISHED PRODUCT)

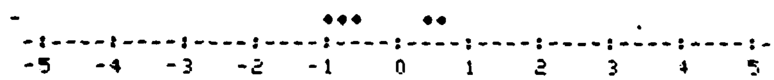
MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	12.1%
STD. DEV.	=	11.2%
MIN. OBS.	=	5%
MAX. OBS.	=	25%



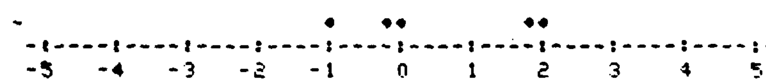
OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	11.1%
STD. DEV.	=	10.3%
MIN. OBS.	=	0.5%
MAX. OBS.	=	24%



OTHER INDUSTRY

NO. OBS.	=	5
MEAN	=	21.8%
STD. DEV.	=	17.9%
MIN. OBS.	=	1%
MAX. OBS.	=	42%



ALL RESPONSES

NO. OBS.	=	13
MIN. OBS.	=	0.5%
MAX. OBS.	=	42%

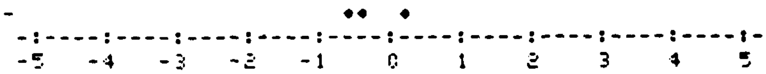
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 15.5% STD. DEV. = 13.8%

Q4 - PERCENTAGE OF VALUE OF PRODUCTS SHIPPED WHICH REPRESENTS NON-CYLINDRICAL MACHINED PARTS (EVEN IF THEY WERE PART OF AN ASSEMBLY OR FINISHED PRODUCT)

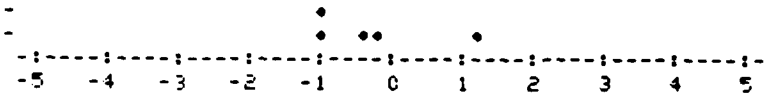
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 10.3%
STD. DEV. = 4.6%
MIN. OBS. = 5.9%
MAX. OBS. = 15%



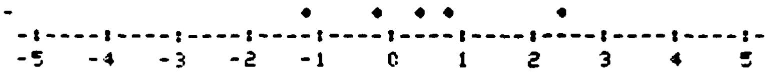
OTHER AEROSPACE

NO. OBS. = 5
MEAN = 10.1%
STD. DEV. = 9.8%
MIN. OBS. = 2.0%
MAX. OBS. = 26%



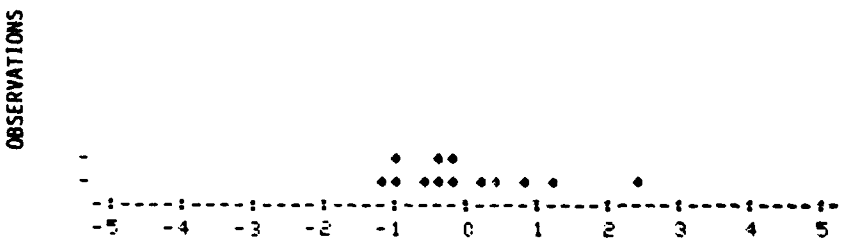
OTHER INDUSTRY

NO. OBS. = 5
MEAN = 18.6%
STD. DEV. = 14.5%
MIN. OBS. = 1.0%
MAX. OBS. = 40%



ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = 1%
MAX. OBS. = 40%

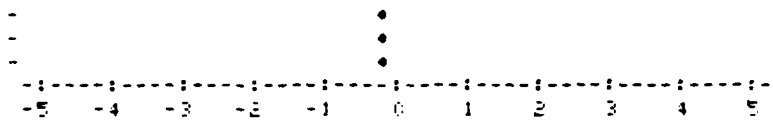


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 13.4% STD. DEV. = 11.1%

Q5 - ANNUAL DOLLAR VALUE OF CYLINDRICAL PARTS PURCHASED FROM OUTSIDE SOURCES

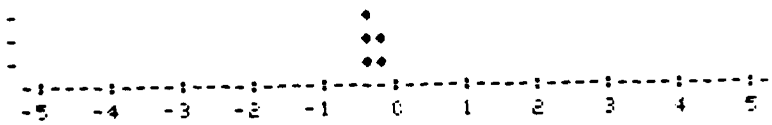
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = $2.0 MIL
STD. DEV. = $1.1 MIL
MIN. OBS. = $0.8 MIL
MAX. OBS. = $3.0 MIL



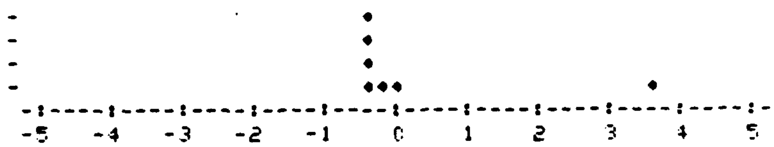
OTHER AEROSPACE

NO. OBS. = 5
MEAN = $1.5 MIL
STD. DEV. = $2.0 MIL
MIN. OBS. = $0.02 MIL
MAX. OBS. = $4.0 MIL



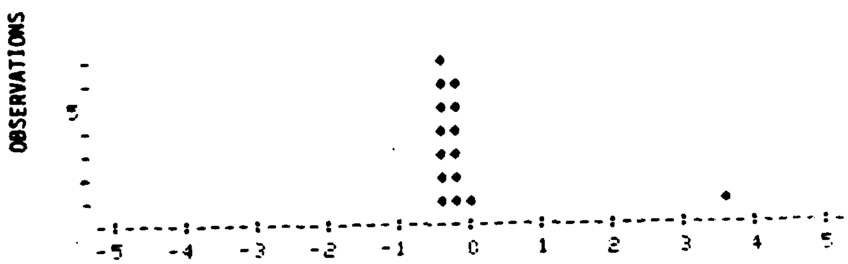
OTHER INDUSTRY

NO. OBS. = 7
MEAN = $11.4 MIL
STD. DEV. = $26.8 MIL
MIN. OBS. = $ 0
MAX. OBS. = $72 MIL



ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = $0
MAX. OBS. = $72 MIL

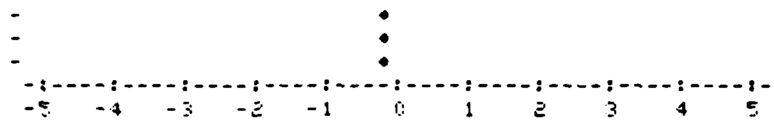


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $6.2 MIL STD. DEV. = $18.3 MIL

Q5 - ANNUAL DOLLAR VALUE OF NON-CYLINDRICAL PARTS PURCHASED FROM OUTSIDE SOURCES

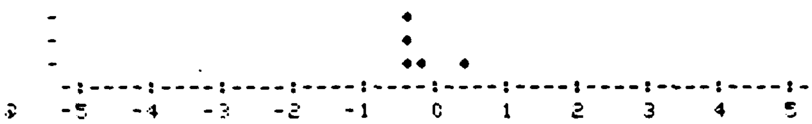
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = $1.5 mil.
STD. DEV. = $0.6 mil.
MIN. OBS. = $1.0 mil.
MAX. OBS. = $2.1 mil.



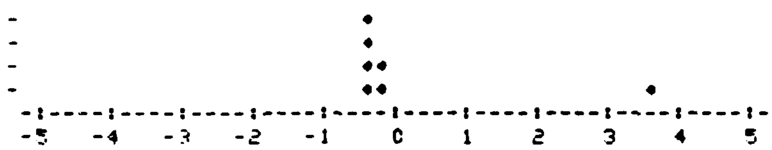
OTHER AEROSPACE

NO. OBS. = 5
MEAN = $1.8 mil.
STD. DEV. = $2.5 mil.
MIN. OBS. = $0.08 mil.
MAX. OBS. = $6.0 mil.



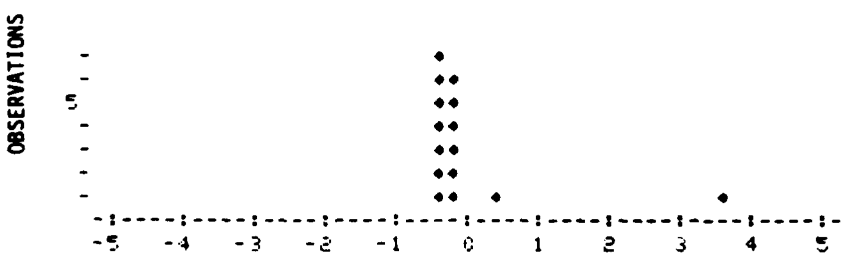
OTHER INDUSTRY

NO. OBS. = 7
MEAN = $5.0 mil.
STD. DEV. = $11.5 mil.
MIN. OBS. = $0.01 mil.
MAX. OBS. = $31 mil.



ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = $0.01 mil.
MAX. OBS. = $31 mil.

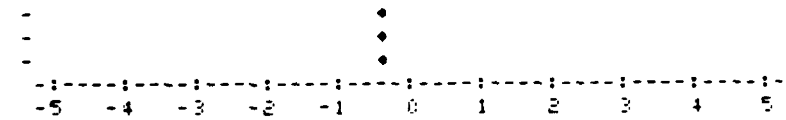


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $3.3 mil. STD. DEV. = $7.8 mil.

Q6 - APPROXIMATE NUMBER OF DIFFERENT TYPES OF CYLINDRICAL PARTS (DIFFERENT PART NUMBERS) MANUFACTURED IN-HOUSE PER YEAR

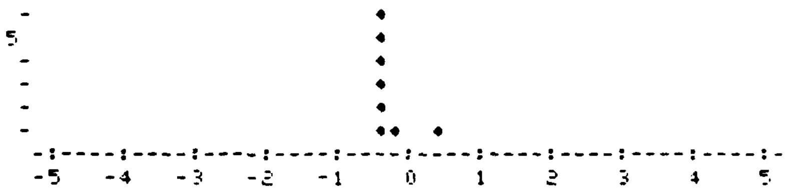
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 877
STD. DEV. = 571
MIN. OBS. = 380
MAX. OBS. = 7500



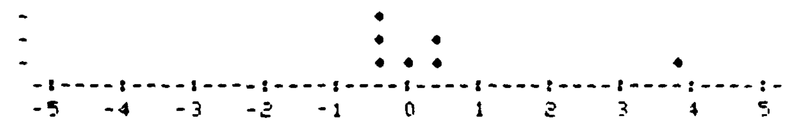
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 3400
STD. DEV. = 4826
MIN. OBS. = 140
MAX. OBS. = 15000



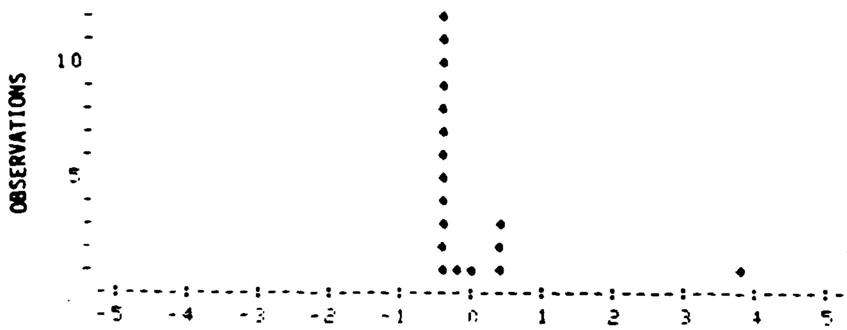
OTHER INDUSTRY

NO. OBS. = 7
MEAN = 17204
STD. DEV. = 28451
MIN. OBS. = 300
MAX. OBS. = 80000



ALL RESPONSES

NO. OBS. = 18
MIN. OBS. = 140
MAX. OBS. = 80000



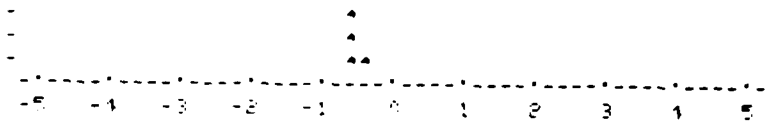
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 8348 STD. DEV. = 18681

Q6 - APPROXIMATE NUMBER OF DIFFERENT TYPES OF NON-CYLINDRICAL PARTS (DIFFERENT PART NUMBERS) MANUFACTURED IN-HOUSE PER YEAR

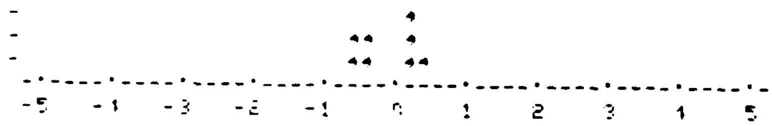
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	1070
STD. DEV.	=	1291
MIN. OBS.	=	350
MAX. OBS.	=	3000



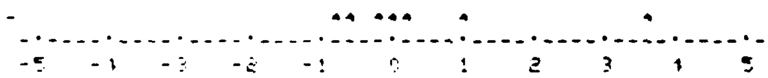
OTHER AEROSPACE

NO. OBS.	=	8
MEAN	=	5034
STD. DEV.	=	3292
MIN. OBS.	=	440
MAX. OBS.	=	9600



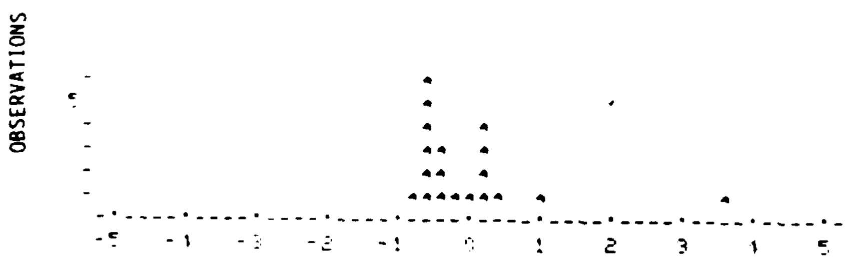
OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	9624
STD. DEV.	=	11971
MIN. OBS.	=	300
MAX. OBS.	=	35000



ALL RESPONSES

NO. OBS.	=	19
MIN. OBS.	=	300
MAX. OBS.	=	35000



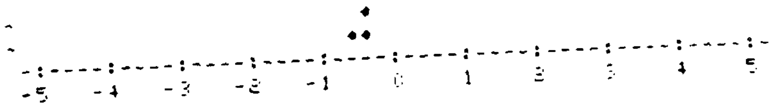
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 5890 STD. DEV. = 7947

Q7 - APPROXIMATE NUMBER OF NEW CYLINDRICAL MACHINED PARTS (NEW PART NUMBERS) INTRODUCED INTO THE PLANT EACH YEAR

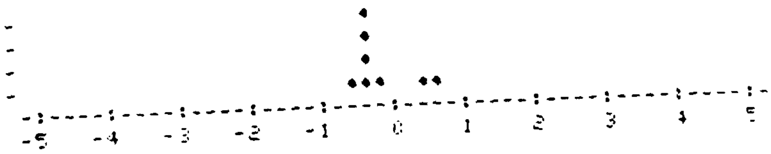
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 195
STD. DEV. = 57
MIN. OBS. = 136
MAX. OBS. = 250



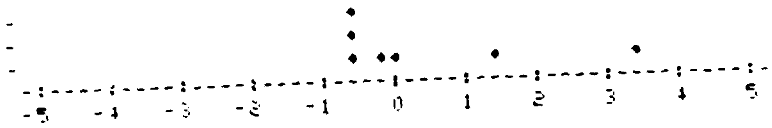
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 659
STD. DEV. = 768
MIN. OBS. = 30
MAX. OBS. = 2000



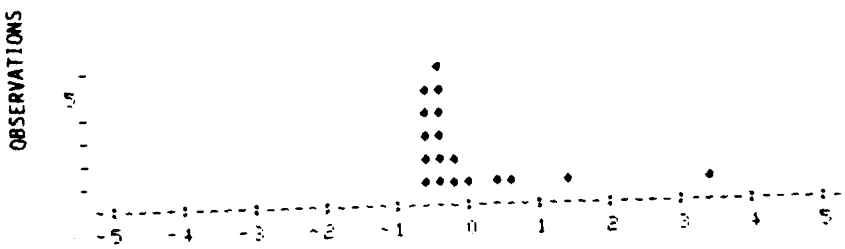
OTHER INDUSTRY

NO. OBS. = 7
MEAN = 1848
STD. DEV. = 2694
MIN. OBS. = 10
MAX. OBS. = 7250



ALL RESPONSES

NO. OBS. = 18
MIN. OBS. = 10
MAX. OBS. = 7250

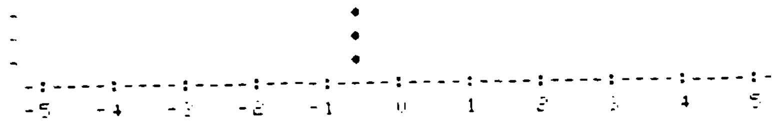


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 1044 STD. DEV = 1808

Q10 - PERCENTAGE OF CYLINDRICAL PARTS WHICH HAVE GREATER THAN 10 BATCHES MADE PER YEAR

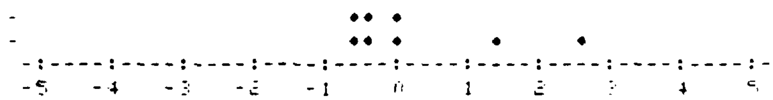
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 0%
STD. DEV. = 0%
MIN. OBS. = 0%
MAX. OBS. = 0%



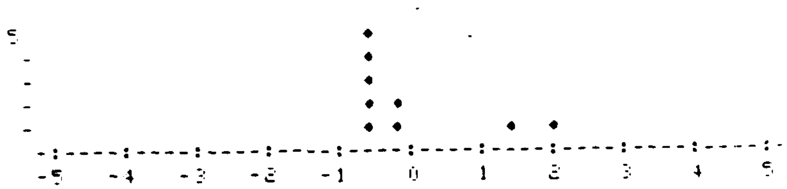
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 27%
STD. DEV. = 35%
MIN. OBS. = 0%
MAX. OBS. = 100%



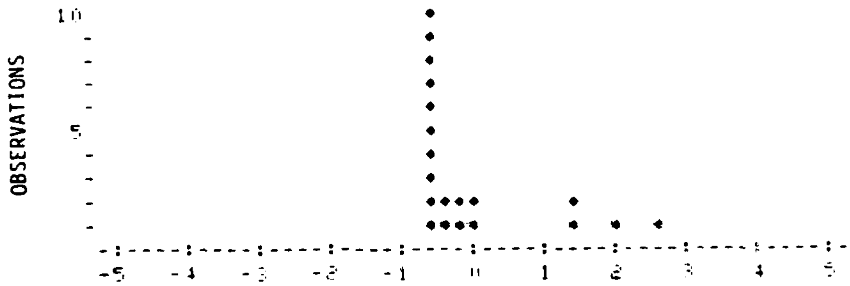
OTHER INDUSTRY

NO. OBS. = 9
MEAN = 18%
STD. DEV. = 30%
MIN. OBS. = 0%
MAX. OBS. = 80%



ALL RESPONSES

NO. OBS. = 20
MIN. OBS. = 0%
MAX. OBS. = 100%



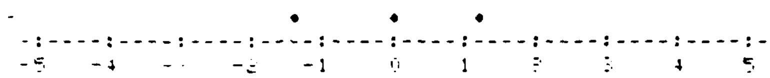
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 19% STD. DEV. = 30%

Q10 - PERCENTAGE OF NON-CYLINDRICAL PARTS WHICH HAVE BETWEEN 2 and 10 BATCHES MADE PER YEAR

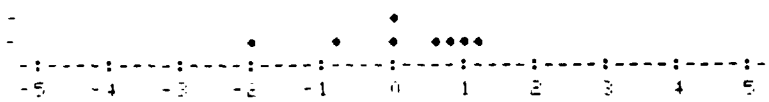
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 60%
STD. DEV. = 40%
MIN. OBS. = 20%
MAX. OBS. = 100%



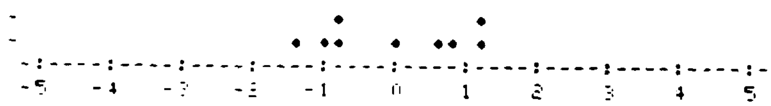
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 66%
STD. DEV. = 34%
MIN. OBS. = 0%
MAX. OBS. = 100%



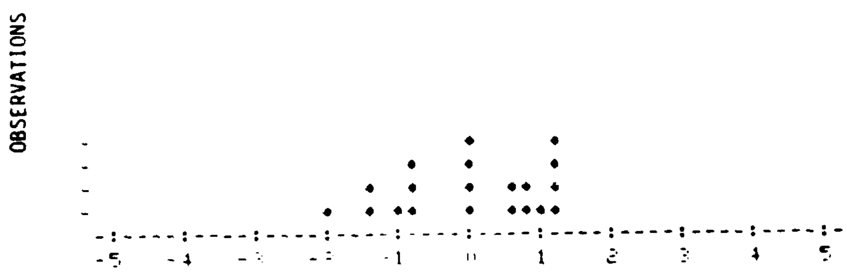
OTHER INDUSTRY

NO. OBS. = 9
MEAN = 62%
STD. DEV. = 32%
MIN. OBS. = 15%
MAX. OBS. = 100%



ALL RESPONSES

NO. OBS. = 20
MIN. OBS. = 0%
MAX. OBS. = 100%



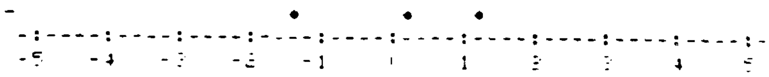
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 63% STD. DEV. = 32%

Q10 - PERCENTAGE OF CYLINDRICAL PARTS WHICH HAVE BETWEEN 2 AND 10 BATCHES MADE PER YEAR

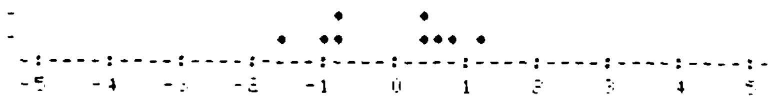
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 63%
STD. DEV. = 40%
MIN. OBS. = 20%
MAX. OBS. = 100%



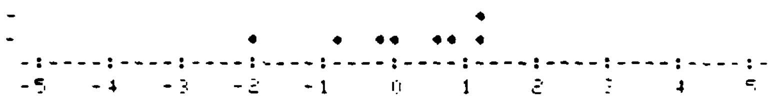
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 67%
STD. DEV. = 34%
MIN. OBS. = 0%
MAX. OBS. = 100%



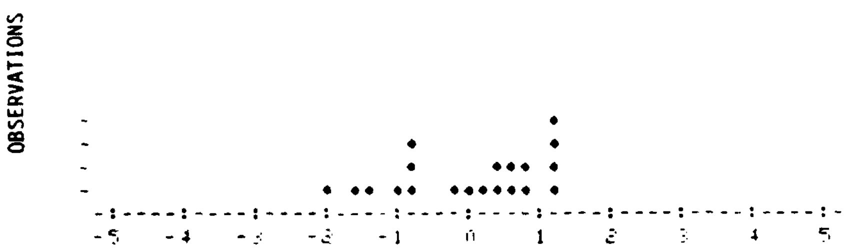
OTHER INDUSTRY

NO. OBS. = 9
MEAN = 61%
STD. DEV. = 30%
MIN. OBS. = 15%
MAX. OBS. = 100%



ALL RESPONSES

NO. OBS. = 20
MIN. OBS. = 0%
MAX. OBS. = 100%

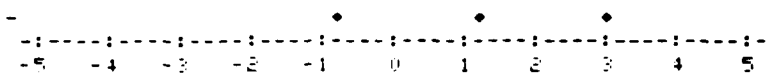


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 63% STD. DEV. = 31%

Q10 - PERCENTAGE OF NON-CYLINDRICAL PARTS WHICH HAVE ONLY 1 BATCH MADE PER YEAR

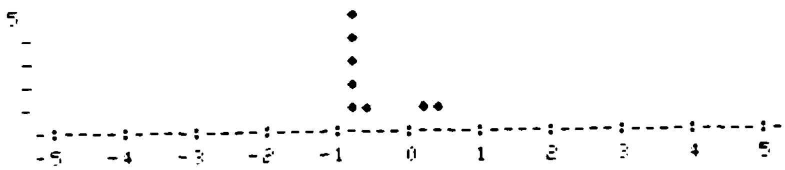
MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	40%
STD. DEV.	=	40%
MIN. OBS.	=	0%
MAX. OBS.	=	80%



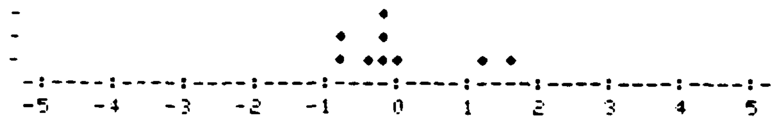
OTHER AEROSPACE

NO. OBS.	=	8
MEAN	=	6%
STD. DEV.	=	10%
MIN. OBS.	=	0%
MAX. OBS.	=	22%



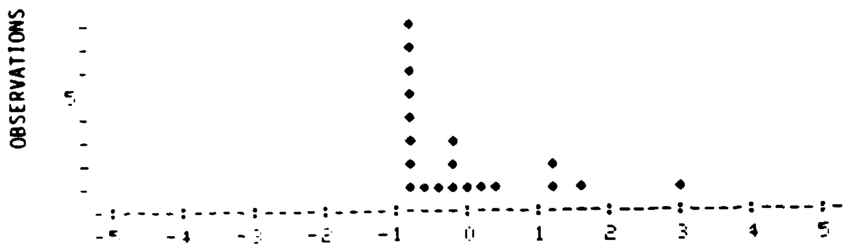
OTHER INDUSTRY

NO. OBS.	=	9
MEAN	=	16%
STD. DEV.	=	18%
MIN. OBS.	=	0%
MAX. OBS.	=	50%



ALL RESPONSES

NO. OBS.	=	20
MIN. OBS.	=	0%
MAX. OBS.	=	80%



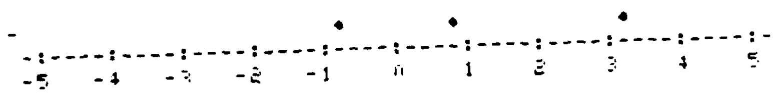
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 15% STD. DEV. = 22%

Q10 - PERCENTAGE OF CYLINDRICAL PARTS WHICH HAVE ONLY 1 BATCH MADE PER YEAR

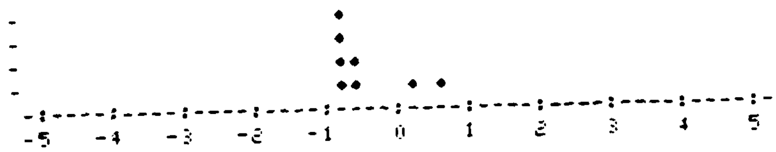
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 37%
STD. DEV. = 40%
MIN. OBS. = 0%
MAX. OBS. = 80%



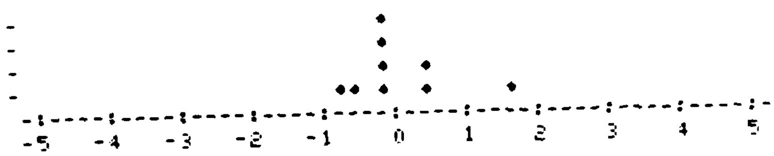
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 6%
STD. DEV. = 11%
MIN. OBS. = 0%
MAX. OBS. = 27%



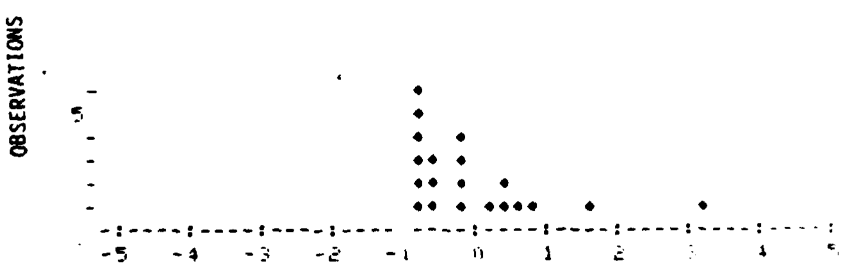
OTHER INDUSTRY

NO. OBS. = 9
MEAN = 16%
STD. DEV. = 15%
MIN. OBS. = 0%
MAX. OBS. = 50%



ALL RESPONSES

NO. OBS. = 20
MIN. OBS. = 0%
MAX. OBS. = 80%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 15% STD. DEV. = 20%

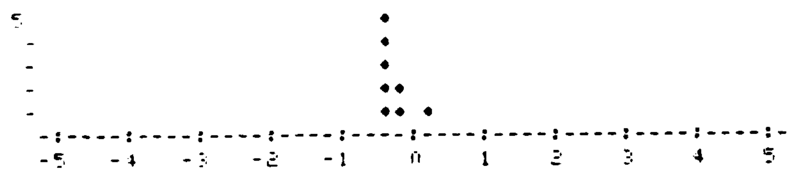
Q9 - PERCENTAGE OF NON-CYLINDRICAL PARTS WHICH ARE MANUFACTURED IN BATCHES OF GREATER THAN 1000 PARTS PER BATCH

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 0.3%
STD. DEV. = 0.6%
MIN. OBS. = 0%
MAX. OBS. = 1%

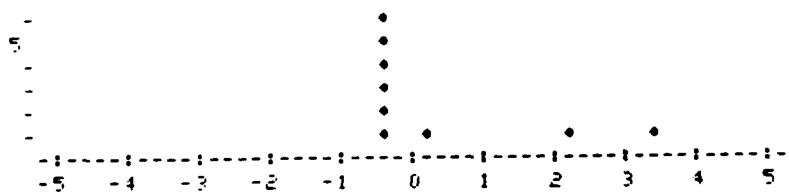
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 1.3%
STD. DEV. = 1.8%
MIN. OBS. = 0%
MAX. OBS. = 5%



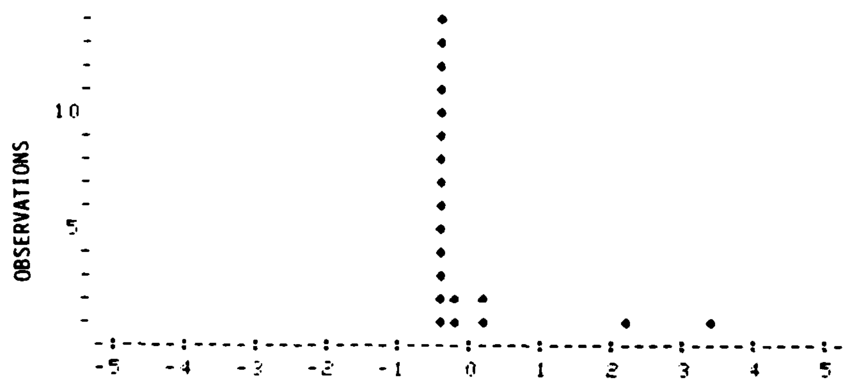
OTHER INDUSTRY

NO. OBS. = 9
MEAN = 6.2%
STD. DEV. = 11.1%
MIN. OBS. = 0%
MAX. OBS. = 30%



ALL RESPONSES

NO. OBS. = 20
MIN. OBS. = 0%
MAX. OBS. = 30%



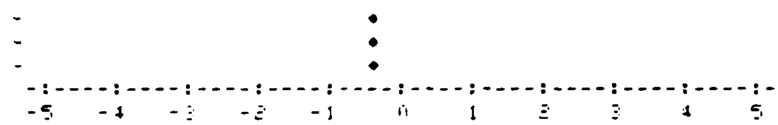
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 3.4% STD. DEV. = 7.7%

Q9 - PERCENTAGE OF CYLINDRICAL PARTS WHICH ARE MANUFACTURED IN BATCHES OF GREATER THAN 1000 PARTS PER BATCH

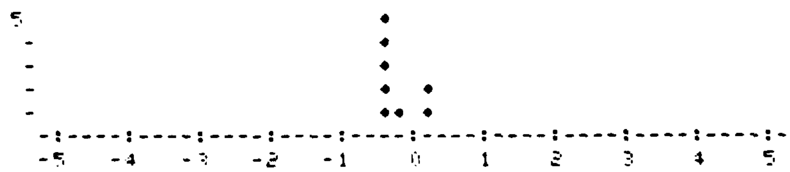
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 0.3%
STD. DEV. = 0.6%
MIN. OBS. = 0%
MAX. OBS. = 1%



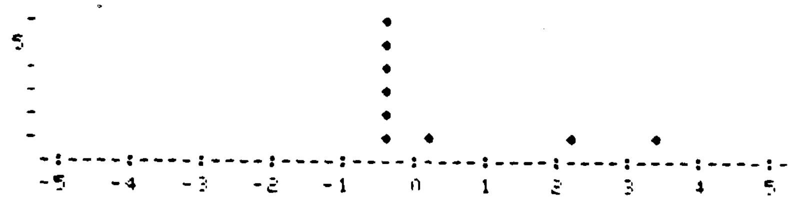
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 1.8%
STD. DEV. = 2.1%
MIN. OBS. = 0%
MAX. OBS. = 5%



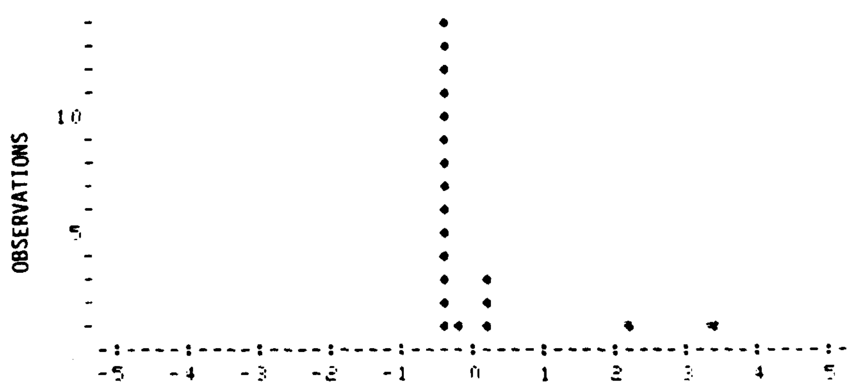
OTHER INDUSTRY

NO. OBS. = 9
MEAN = 6.1%
STD. DEV. = 11.1%
MIN. OBS. = 0%
MAX. OBS. = 30%



ALL RESPONSES

NO. OBS. = 20
MIN. OBS. = 0%
MAX. OBS. = 30%

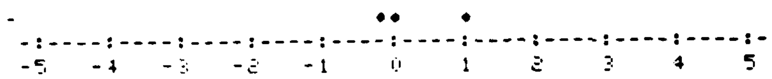


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 3.5% STD. DEV. = 7.7%

Q9 - PERCENTAGE OF NON-CYLINDRICAL PARTS WHICH ARE MANUFACTURED IN BATCHS of 100 to 1000 UNITS PER BATCH

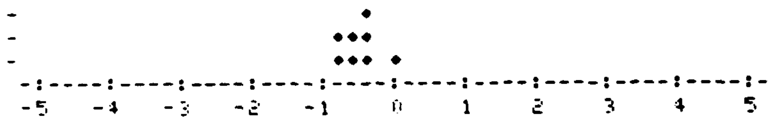
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 28%
STD. DEV. = 19%
MIN. OBS. = 14%
MAX. OBS. = 50%



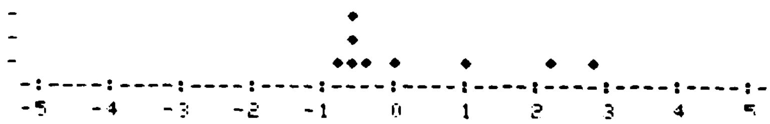
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 7%
STD. DEV. = 6%
MIN. OBS. = 0%
MAX. OBS. = 20%



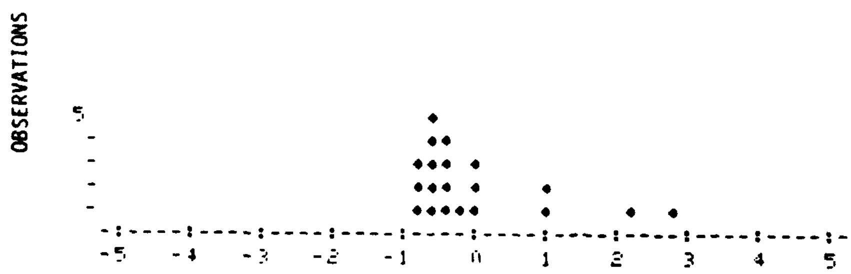
OTHER INDUSTRY

NO. OBS. = 9
MEAN = 29%
STD. DEV. = 38%
MIN. OBS. = 0%
MAX. OBS. = 100%



ALL RESPONSES

NO. OBS. = 20
MIN. OBS. = 0%
MAX. OBS. = 100%

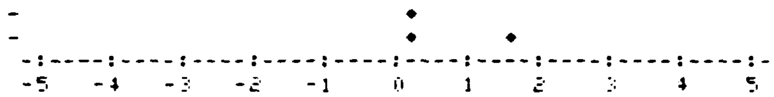


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 20% STD. DEV. = 28%

Q9 - PERCENTAGE OF CYLINDRICAL PARTS WHICH ARE MANUFACTURED IN BATCHES OF 100 TO 1000 UNITS PER BATCH

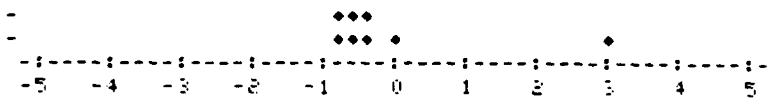
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 30%
STD. DEV. = 18%
MIN. OBS. = 19%
MAX. OBS. = 50%



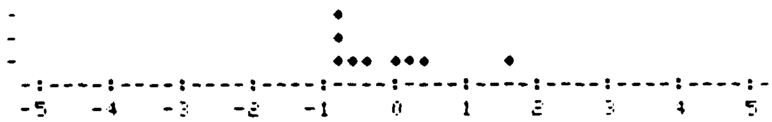
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 14%
STD. DEV. = 25%
MIN. OBS. = 0%
MAX. OBS. = 75%



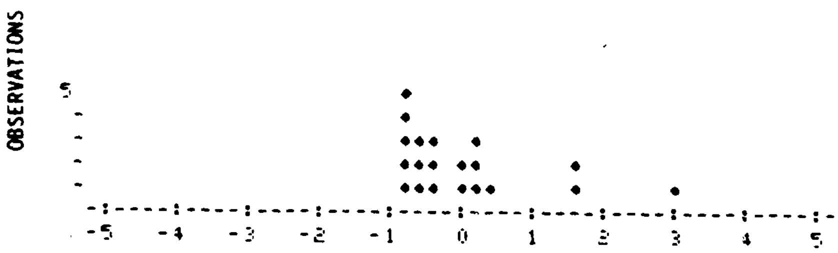
OTHER INDUSTRY

NO. OBS. = 9
MEAN = 14%
STD. DEV. = 16%
MIN. OBS. = 0%
MAX. OBS. = 50%



ALL RESPONSES

NO. OBS. = 20
MIN. OBS. = 0%
MAX. OBS. = 75%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 16% STD. DEV. = 20%

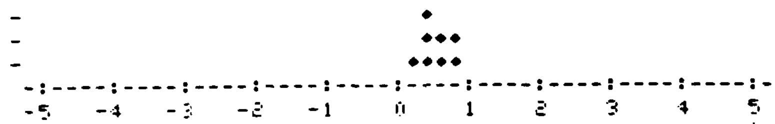
Q9 -- PERCENTAGE OF NON-CYLINDRICAL PARTS WHICH ARE MANUFACTURED IN BATCHES OF LESS THAN 100 UNITS PER BATCH

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 72%
STD. DEV. = 19%
MIN. OBS. = 50%
MAX. OBS. = 80%

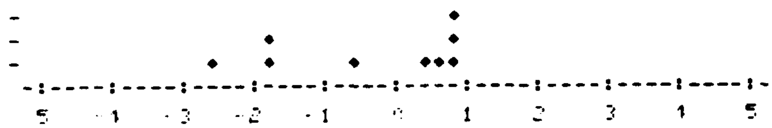
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 92%
STD. DEV. = 7%
MIN. OBS. = 80%
MAX. OBS. = 100%



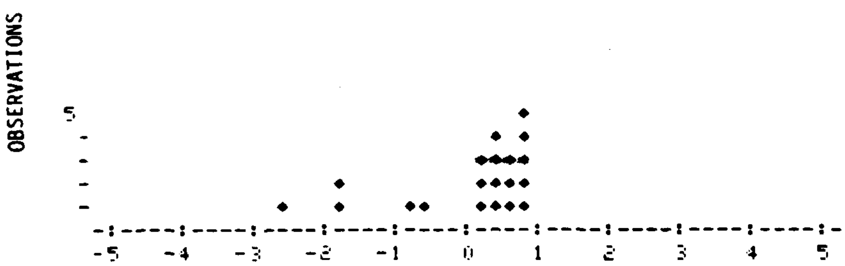
OTHER INDUSTRY

NO. OBS. = 9
MEAN = 64%
STD. DEV. = 41%
MIN. OBS. = 0%
MAX. OBS. = 100%



ALL RESPONSES

NO. OBS. = 20
MIN. OBS. = 0%
MAX. OBS. = 100%



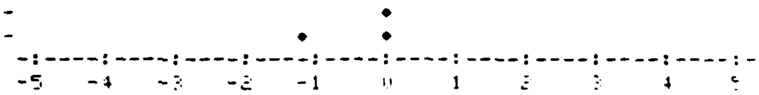
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 76% STD. DEV. = 30%

Q9 -- PERCENTAGE OF CYLINDRICAL PARTS WHICH ARE MANUFACTURED IN BATCHES OF LESS THAN 100 UNITS PER BATCH

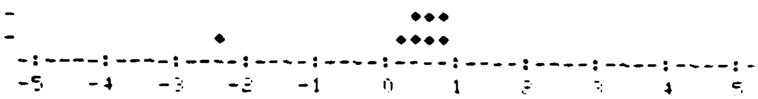
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 70%
STD. DEV. = 17%
MIN. OBS. = 50%
MAX. OBS. = 80%



OTHER AEROSPACE

NO. OBS. = 8
MEAN = 84%
STD. DEV. = 26%
MIN. OBS. = 20%
MAX. OBS. = 100%

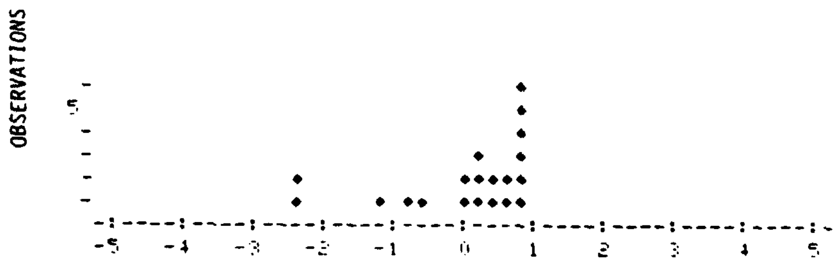


OTHER INDUSTRY

NO. OBS. = 9
MEAN = 79%
STD. DEV. = 27%
MIN. OBS. = 20%
MAX. OBS. = 100%

ALL RESPONSES

NO. OBS. = 20
MIN. OBS. = 20%
MAX. OBS. = 100%



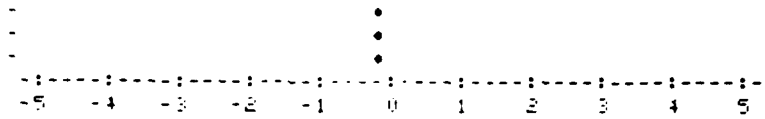
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 80% STD. DEV. = 25%

Q8 - APPROXIMATE TOTAL VOLUME (NUMBER OF UNITS) OF NON-CYLINDRICAL MACHINED PARTS MANUFACTURED IN-HOUSE ASSEMBLY

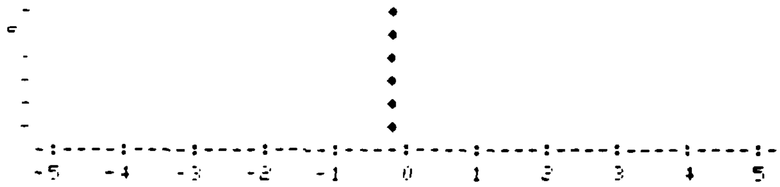
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 206K
STD. DEV. = 341K
MIN. OBS. = 1K
MAX. OBS. = 600K



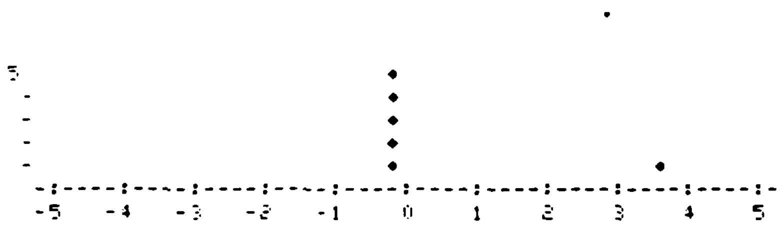
OTHER AEROSPACE

NO. OBS. = 6
MEAN = 673K
STD. DEV. = 669K
MIN. OBS. = 7.5K
MAX. OBS. = 1420K



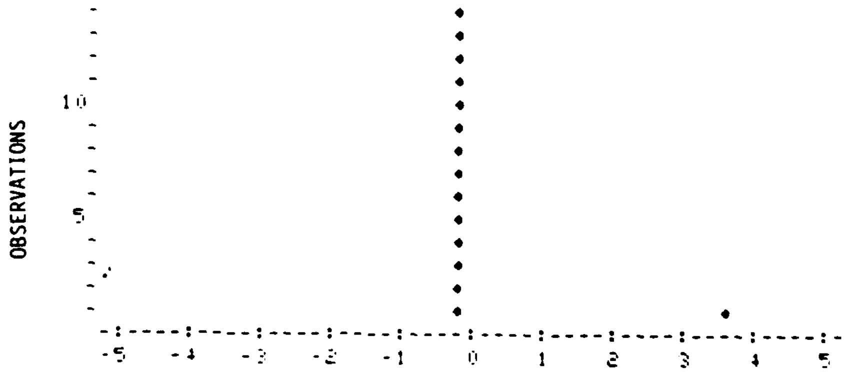
OTHER INDUSTRY

NO. OBS. = 6
MEAN = 8163K
STD. DEV. = 1956K
MIN. OBS. = 1.2K
MAX. OBS. = 4810K



ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = 1K
MAX. OBS. = 48100K

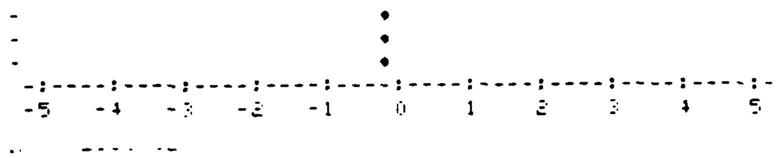


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 3576K STD. DEV. = 12327K

Q8 - APPROXIMATE TOTAL VOLUME (NUMBER OF UNITS)OF CYLINDRICAL MACHINED PARTS MANUFACTURED IN-HOUSE ASSEMBLY

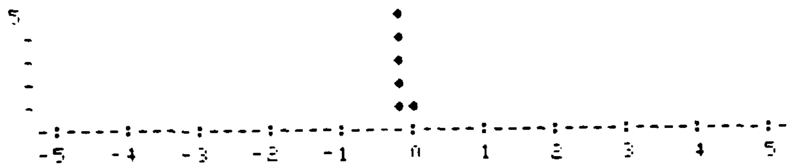
MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	105K
STD. DEV.	=	169K
MIN. OBS.	=	3K
MAX. OBS.	=	300K



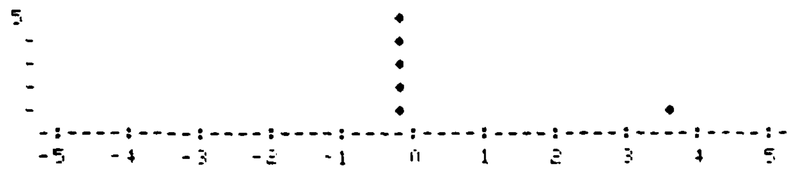
OTHER AEROSPACE

NO. OBS.	=	6
MEAN	=	1199K
STD. DEV.	=	2342K
MIN. OBS.	=	0.3K
MAX. OBS.	=	5950K



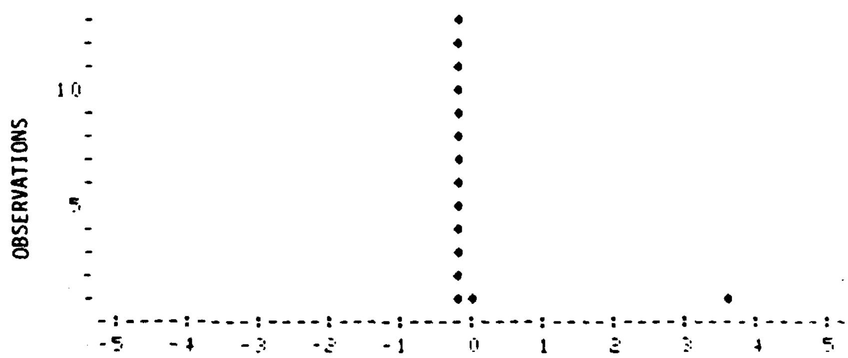
OTHER INDUSTRY

NO. OBS.	=	6
MEAN	=	13713K
STD. DEV.	=	33405K
MIN. OBS.	=	4.5K
MAX. OBS.	=	81900K



ALL RESPONSES

NO. OBS.	=	15
MIN. OBS.	=	0.3K
MAX. OBS.	=	81900K



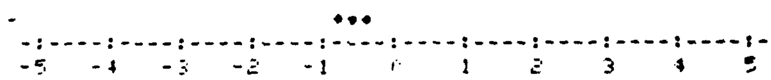
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 5986K STD. DEV. = 21055K

Q7 - APPROXIMATE NUMBER OF NEW NON-CYLINDRICAL MACHINED PARTS (NEW PART NUMBERS) INTRODUCED INTO THE PLANT EACH YEAR

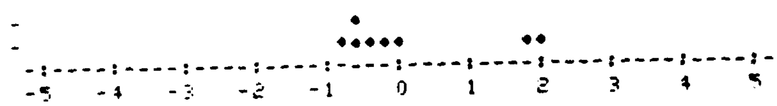
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 252
STD. DEV. = 150
MIN. OBS. = 100
MAX. OBS. = 400



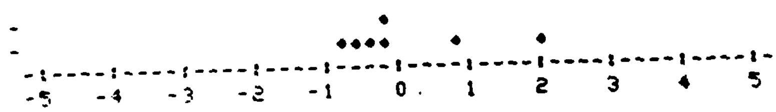
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 1089
STD. DEV. = 1289
MIN. OBS. = 50
MAX. OBS. = 3250



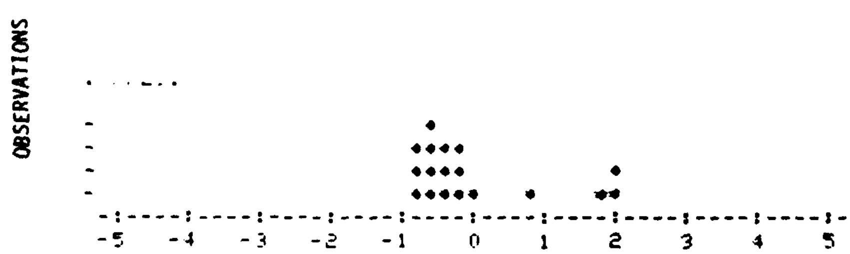
OTHER INDUSTRY

NO. OBS. = 7
MEAN = 1014
STD. DEV. = 1161
MIN. OBS. = 30
MAX. OBS. = 3250



ALL RESPONSES

NO. OBS. = 18
MIN. OBS. = 80
MAX. OBS. = 3250



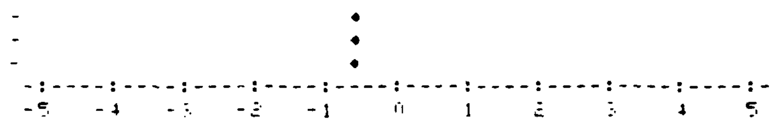
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 920 STD. DEV. = 1122

Q10 - PERCENTAGE OF NON-CYLINDRICAL PARTS WHICH HAVE GREATER THAN 10 BATCHES MADE PER YEAR

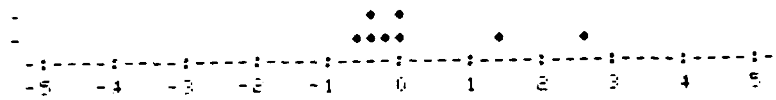
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 0%
STD. DEV. = 0%
MIN. OBS. = 0%
MAX. OBS. = 0%



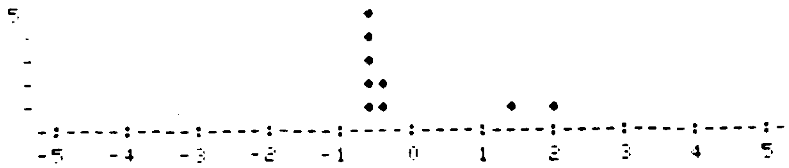
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 29%
STD. DEV. = 35%
MIN. OBS. = 0%
MAX. OBS. = 100%



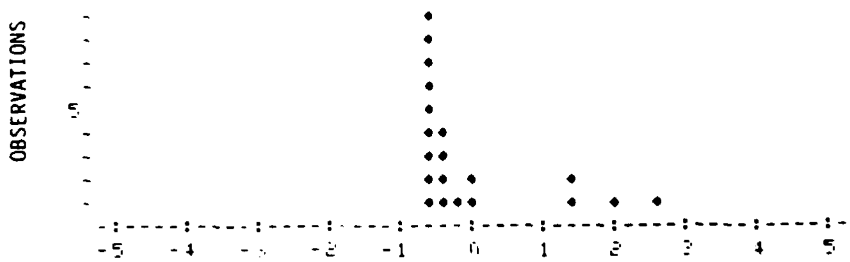
OTHER INDUSTRY

NO. OBS. = 9
MEAN = 18%
STD. DEV. = 30%
MIN. OBS. = 0%
MAX. OBS. = 80%



ALL RESPONSES

NO. OBS. = 20
MIN. OBS. = 0%
MAX. OBS. = 100%



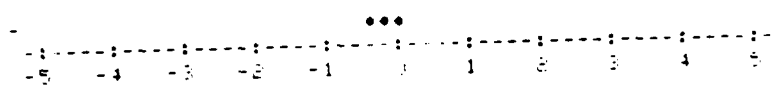
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 20% STD. DEV. = 31%

Q11 - PERCENTAGE OF CYLINDRICAL PARTS WITH 1 TO 10 OPERATIONS PER PROCESS PLAN

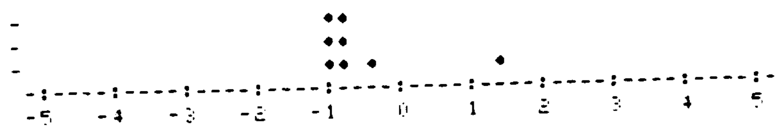
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 25%
STD. DEV. = 5%
MIN. OBS. = 20%
MAX. OBS. = 30%



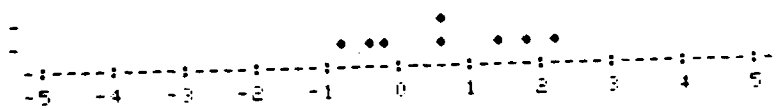
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 15%
STD. DEV. = 25%
MIN. OBS. = 2%
MAX. OBS. = 75%



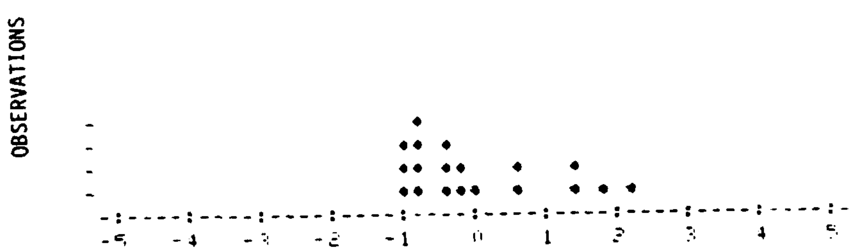
OTHER INDUSTRY

NO. OBS. = 8
MEAN = 53%
STD. DEV. = 34%
MIN. OBS. = 10%
MAX. OBS. = 100%



ALL RESPONSES

NO. OBS. = 19
MIN. OBS. = 2%
MAX. OBS. = 100%



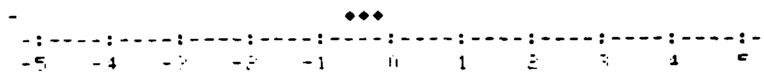
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 33% STD. DEV. = 32%

Q11 - PERCENTAGE OF NON-CYLINDRICAL PARTS WITH 1 TO 10 OPERATIONS PER PROCESS PLAN

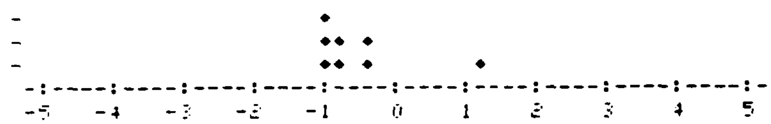
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 23%
STD. DEV. = 8%
MIN. OBS. = 15%
MAX. OBS. = 30%



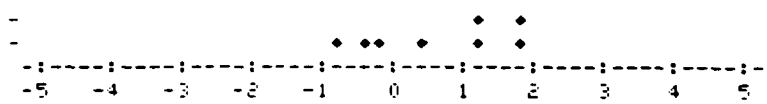
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 17%
STD. DEV. = 25%
MIN. OBS. = 0%
MAX. OBS. = 75%



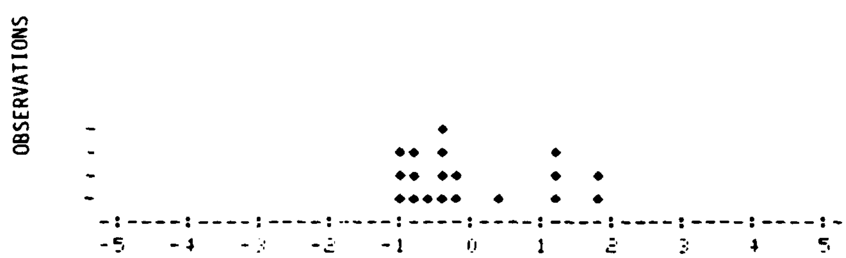
OTHER INDUSTRY

NO. OBS. = 8
MEAN = 59%
STD. DEV. = 36%
MIN. OBS. = 5%
MAX. OBS. = 100%



ALL RESPONSES

NO. OBS. = 19
MIN. OBS. = 0%
MAX. OBS. = 100%

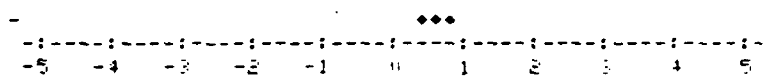


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 35% STD. DEV. = 34%

Q11 - PERCENTAGE OF CYLINDRICAL PARTS WITH 10 TO 25 OPERATIONS PER PROCESS PLAN

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 65%
STD. DEV. = 5%
MIN. OBS. = 60%
MAX. OBS. = 70%

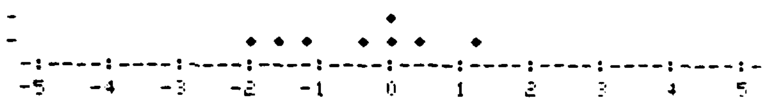


OTHER AEROSPACE

NO. OBS. = 8
MEAN = 57%
STD. DEV. = 23%
MIN. OBS. = 20%
MAX. OBS. = 88%

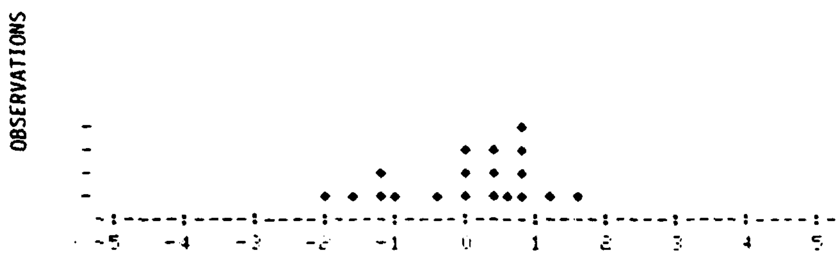
OTHER INDUSTRY

NO. OBS. = 8
MEAN = 39%
STD. DEV. = 27%
MIN. OBS. = 0%
MAX. OBS. = 80%



ALL RESPONSES

NO. OBS. = 19
MIN. OBS. = 0%
MAX. OBS. = 88%

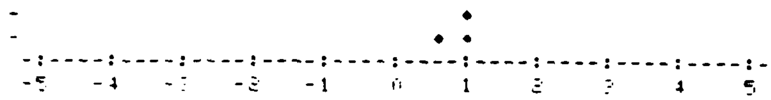


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 51% STD. DEV. = 25%

Q11 - PERCENTAGE OF NON-CYLINDRICAL PARTS WITH 10 TO 25 OPERATIONS PER PROCESS PLAN

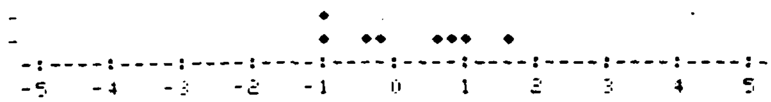
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 67%
STD. DEV. = 6%
MIN. OBS. = 60%
MAX. OBS. = 70%



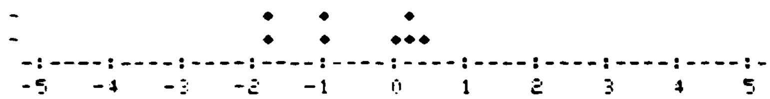
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 49%
STD. DEV. = 24%
MIN. OBS. = 20%
MAX. OBS. = 84%



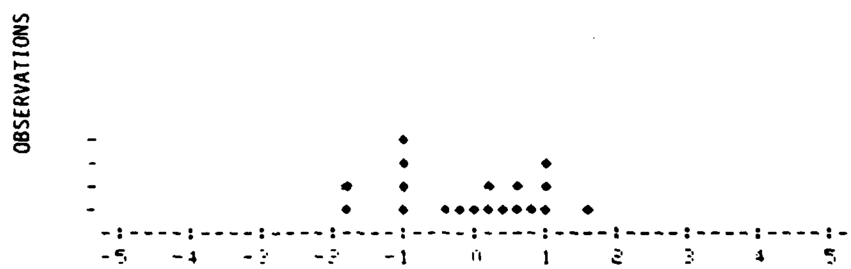
OTHER INDUSTRY

NO. OBS. = 8
MEAN = 30%
STD. DEV. = 23%
MIN. OBS. = 0%
MAX. OBS. = 55%



ALL RESPONSES

NO. OBS. = 19
MIN. OBS. = 0%
MAX. OBS. = 84%



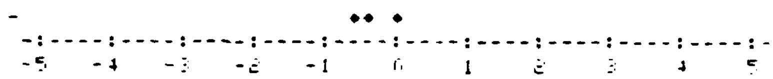
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 44% STD. DEV. = 25%

Q11 - PERCENT OF CYLINDRICAL PARTS WITH > 25 OPERATIONS

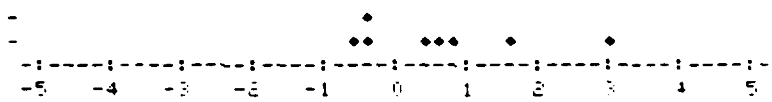
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 10%
STD. DEV. = 5%
MIN. OBS. = 5%
MAX. OBS. = 15%



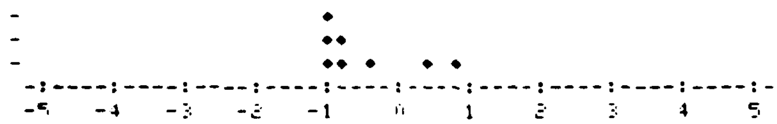
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 28%
STD. DEV. = 22%
MIN. OBS. = 5%
MAX. OBS. = 70%



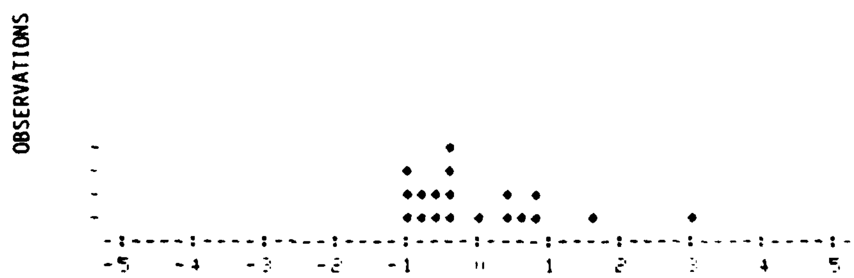
OTHER INDUSTRY

NO. OBS. = 8
MEAN = 8%
STD. DEV. = 12%
MIN. OBS. = 0%
MAX. OBS. = 30%



ALL RESPONSES

NO. OBS. = 19
MIN. OBS. = 0%
MAX. OBS. = 70%



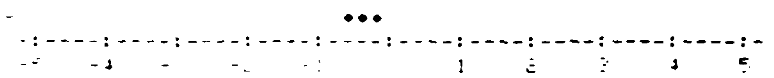
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 17% STD. DEV. = 18%

Q11 - PERCENT OF NON-CYLINDRICAL PARTS WITH > 25 OPERATIONS

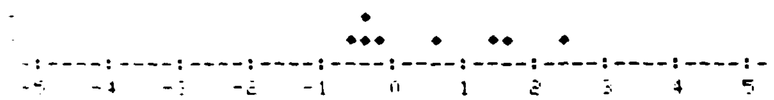
MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	10%
STD. DEV.	=	5%
MIN. OBS.	=	5%
MAX. OBS.	=	15%



OTHER AEROSPACE

NO. OBS.	=	8
MEAN	=	34
STD. DEV.	=	28%
MIN. OBS.	=	5%
MAX. OBS.	=	80%

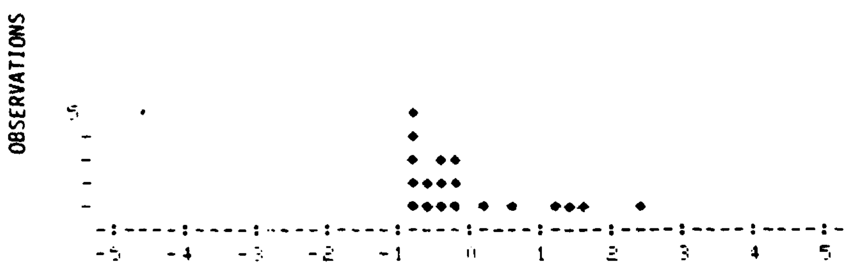


OTHER INDUSTRY

NO. OBS.	=	8
MEAN	=	11%
STD. DEV.	=	18%
MIN. OBS.	=	0%
MAX. OBS.	=	50%

ALL RESPONSES

NO. OBS.	=	19
MIN. OBS.	=	0%
MAX. OBS.	=	80%



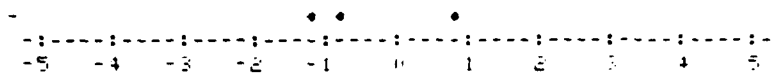
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 21% STD. DEV. = 24%

Q12 - PERCENT OF CYLINDRICAL PARTS WITH > 5 PARTS PER FAMILY

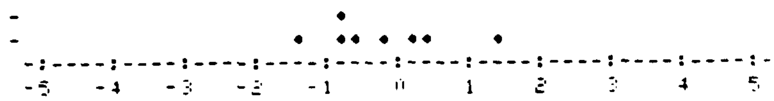
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 31%
STD. DEV. = 34%
MIN. OBS. = 5%
MAX. OBS. = 75%



OTHER AEROSPACE

NO. OBS. = 8
MEAN = 38%
STD. DEV. = 24%
MIN. OBS. = 0%
MAX. OBS. = 90%

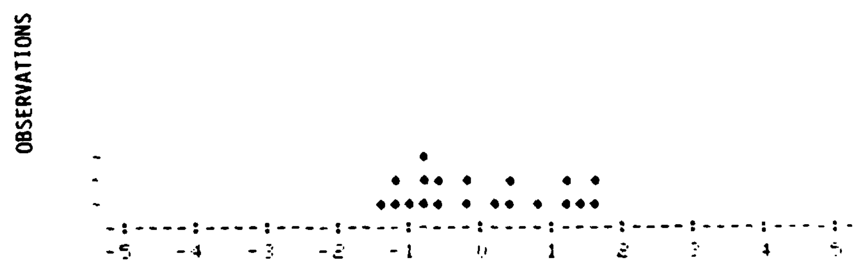


OTHER INDUSTRY

NO. OBS. = 9
MEAN = 57%
STD. DEV. = 38%
MIN. OBS. = 5%
MAX. OBS. = 100%

ALL RESPONSES

NO. OBS. = 20
MIN. OBS. = 0%
MAX. OBS. = 100%



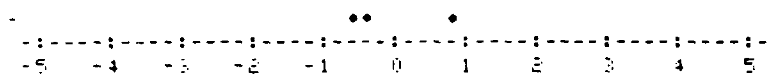
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 45% STD. DEV. = 34%

Q12 - PERCENT OF NON-CYLINDRICAL PARTS WITH > 5 PARTS PER FAMILY

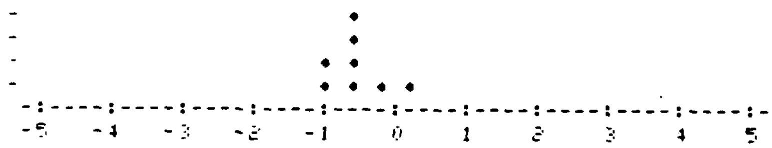
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 31%
STD. DEV. = 25%
MIN. OBS. = 15%
MAX. OBS. = 60%



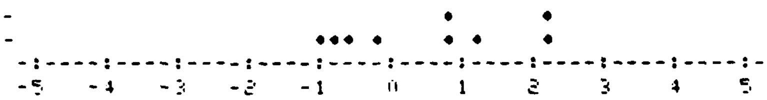
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 15%
STD. DEV. = 13%
MIN. OBS. = 0%
MAX. OBS. = 40%



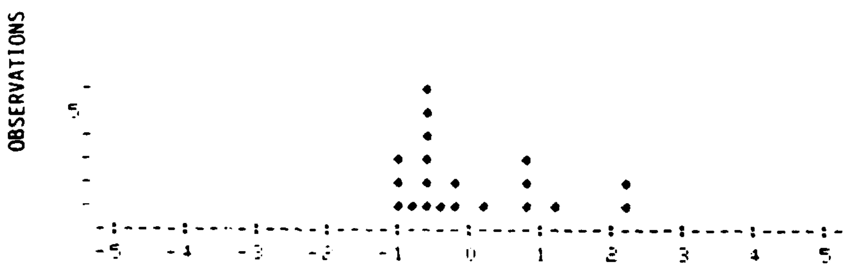
OTHER INDUSTRY

NO. OBS. = 9
MEAN = 48%
STD. DEV. = 32%
MIN. OBS. = 0%
MAX. OBS. = 100%



ALL RESPONSES

NO. OBS. = 20
MIN. OBS. = 0%
MAX. OBS. = 100%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 32% STD. DEV. = 32%

Q12 - PERCENT OF CYLINDRICAL PARTS WITH 2-5 PARTS PER FAMILY

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 39%
STD. DEV. = 20%
MIN. OBS. = 20%
MAX. OBS. = 60%

OTHER AEROSPACE

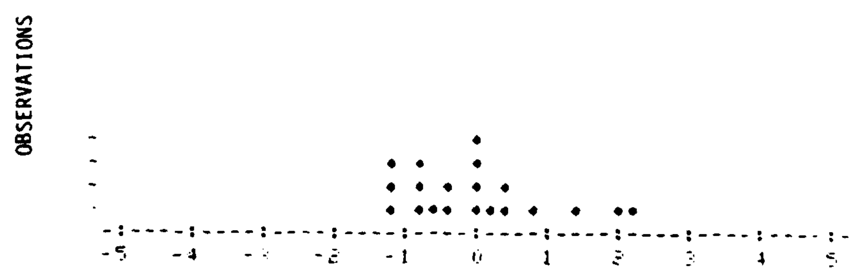
NO. OBS. = 8
MEAN = 42%
STD. DEV. = 26%
MIN. OBS. = 0%
MAX. OBS. = 75%

OTHER INDUSTRY

NO. OBS. = 9
MEAN = 15%
STD. DEV. = 13%
MIN. OBS. = 0%
MAX. OBS. = 40%

ALL RESPONSES

NO. OBS. = 20
MIN. OBS. = 0%
MAX. OBS. = 75%



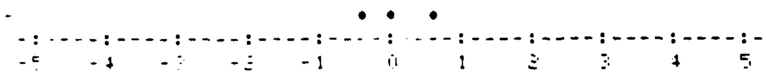
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 29% STD. DEV. = 23%

Q12 - PERCENT OF NON-CYLINDRICAL PARTS WITH 2-5 PARTS PER FAMILY

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 37%
STD. DEV. = 13%
MIN. OBS. = 25%
MAX. OBS. = 50%

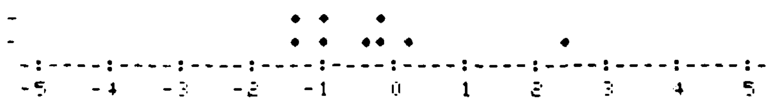


OTHER AEROSPACE

NO. OBS. = 8
MEAN = 44%
STD. DEV. = 24%
MIN. OBS. = 10%
MAX. OBS. = 80%

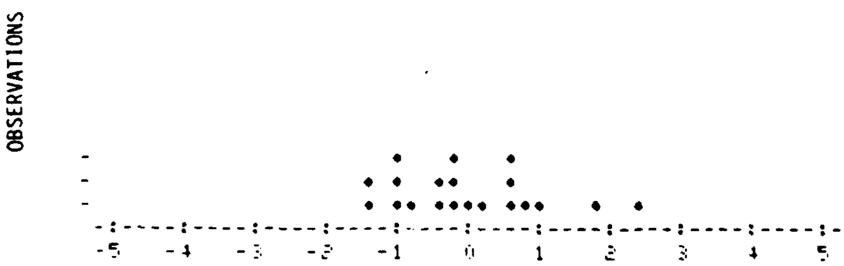
OTHER INDUSTRY

NO. OBS. = 9
MEAN = 27%
STD. DEV. = 31%
MIN. OBS. = 0%
MAX. OBS. = 100%



ALL RESPONSES

NO. OBS. = 20
MIN. OBS. = 0%
MAX. OBS. = 100%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 35%   STD. DEV. = 26%

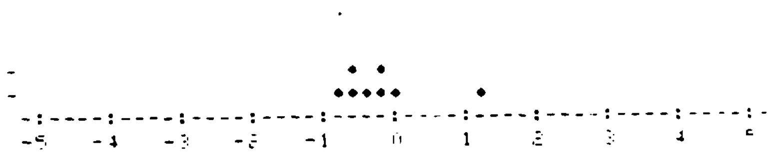
Q12 - PERCENT OF CYLINDRICAL PARTS, TOTALLY DIFFERENT

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 30%
STD. DEV. = 18%
MIN. OBS. = 10%
MAX. OBS. = 46%

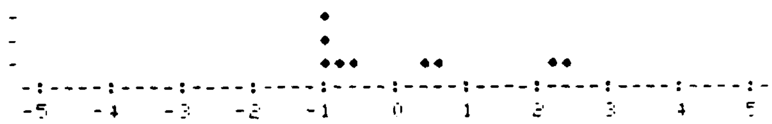
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 20%
STD. DEV. = 16%
MIN. OBS. = 5%
MAX. OBS. = 55%



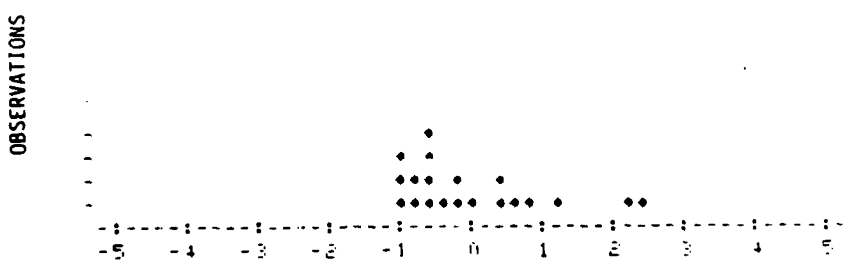
OTHER INDUSTRY

NO. OBS. = 9
MEAN = 28%
STD. DEV. = 34%
MIN. OBS. = 0%
MAX. OBS. = 85%



ALL RESPONSES

NO. OBS. = 20
MIN. OBS. = 0%
MAX. OBS. = 85%



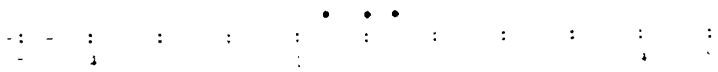
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 25% STD. DEV. = 25%

Q12 - PERCENT OF NON-CYLINDRICAL PARTS, TOTALLY DIFFERENT

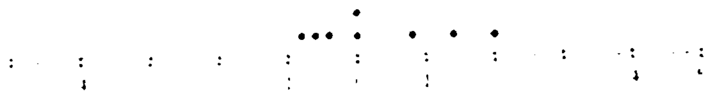
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 32
STD. DEV. = 16%
MIN. OBS. = 15%
MAX. OBS. = 46%



OTHER AEROSPACE

NO. OBS. = 8
MEAN = 41%
STD. DEV. = 29
MIN. OBS. = 10
MAX. OBS. = 90

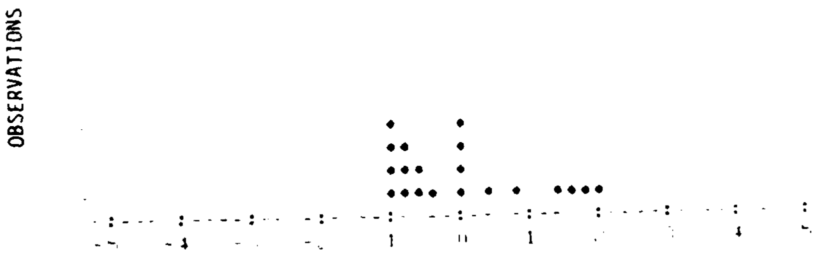


OTHER INDUSTRY

NO. OBS. = 9
MEAN = 25%
STD. DEV. = 34%
MIN. OBS. = 0%
MAX. OBS. = 85

ALL RESPONSES

NO. OBS. = 20
MIN. OBS. = 0%
MAX. OBS. = 90%

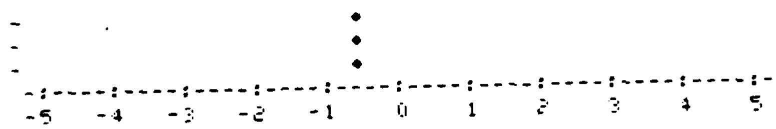


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 33% STD. DEV. = 30

Q13 - ANNUAL NUMBER OF PROCESS PLANS FOR NEW CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 145
STD. DEV. = 51
MIN. OBS. = 100
MAX. OBS. = 136



OTHER AEROSPACE

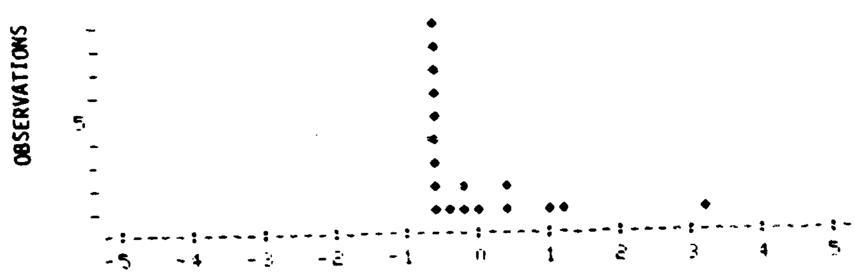
NO. OBS. = 8
MEAN = 673
STD. DEV. = 801
MIN. OBS. = 30
MAX. OBS. = 2000

OTHER INDUSTRY

NO. OBS. = 7
MEAN = 2276
STD. DEV. = 2589
MIN. OBS. = 50
MAX. OBS. = 7250

ALL RESPONSES

NO. OBS. = 18
MIN. OBS. = 30
MAX. OBS. = 7250



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 1208 STD. DEV. = 1853

16 - PERCENTAGE OF PROCESS PLANNING COSTS TO SELECT MACHINES AND EQUIPMENT FOR A NEW NON-CYLINDRICAL PART

MISSILE PRIMES & SUBS

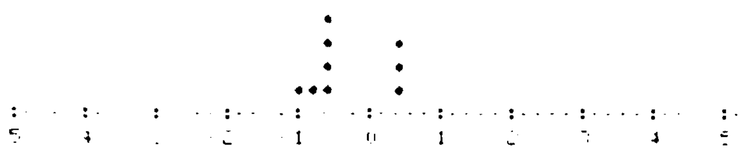
NO. OBS. = 3
MEAN = 11%
STD. DEV. = 8.6%
MIN. OBS. = 3%
MAX. OBS. = 20%

OTHER AEROSPACE

NO. OBS. = 8
MEAN = 8.5
STD. DEV. = 6.5%
MIN. OBS. = 2%
MAX. OBS. = 20

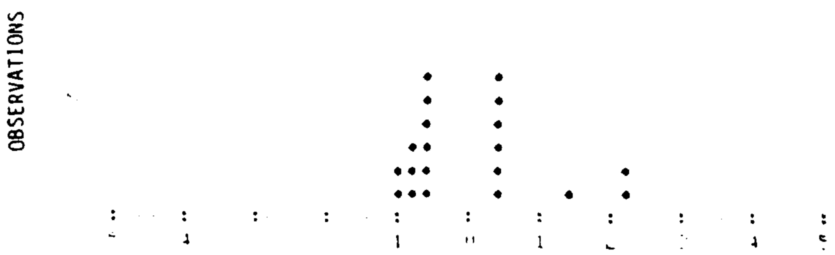
OTHER INDUSTRY

NO. OBS. = 9
MEAN = 6.1%
STD. DEV. = 3.1%
MIN. OBS. = 2%
MAX. OBS. = 10%



ALL RESPONSES

NO. OBS. = 20
MIN. OBS. = 2%
MAX. OBS. = 20%



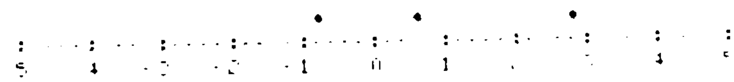
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 7.8% STD. DEV. = 5.5%

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO SELECT MACHINES AND EQUIPMENT FOR A NEW CYLINDRICAL PART

MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	11%
STD. DEV.	=	8.5%
MIN. OBS.	=	3%
MAX. OBS.	=	20%

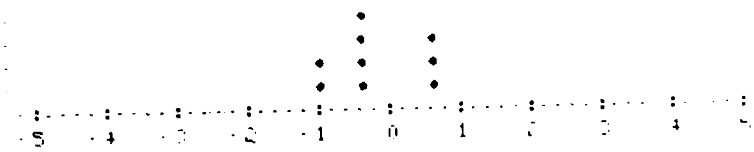


OTHER AEROSPACE

NO. OBS.	=	8
MEAN	=	6.5%
STD. DEV.	=	4.6%
MIN. OBS.	=	2%
MAX. OBS.	=	15%

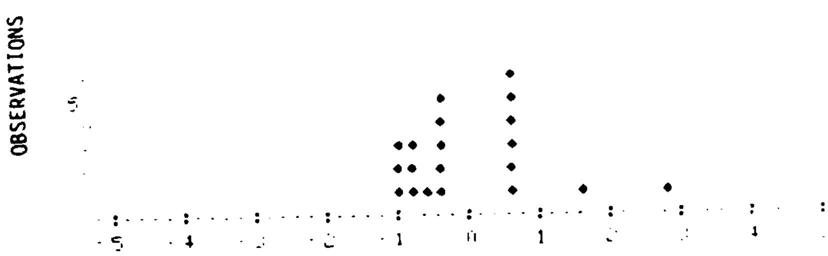
OTHER INDUSTRY

NO. OBS.	=	9
MEAN	=	6%
STD. DEV.	=	3.2%
MIN. OBS.	=	2%
MAX. OBS.	=	10%



ALL RESPONSES

NO. OBS.	=	20
MIN. OBS.	=	2%
MAX. OBS.	=	15%



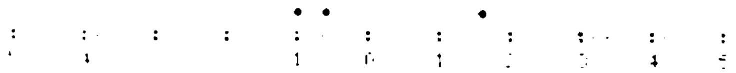
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 7% STD. DEV. = 4.8%

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO DETERMINE OPERATION SEQUENCES FOR A NEW NON-CYLINDRICAL PART

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 20.7
STD. DEV. = 25.7%
MIN. OBS. = 2%
MAX. OBS. = 50%



OTHER AEROSPACE

NO. OBS. = 8
MEAN = 14.9%
STD. DEV. = 15.9%
MIN. OBS. = 4%
MAX. OBS. = 50

OTHER INDUSTRY

NO. OBS. = 9
MEAN = 25.3%
STD. DEV. = 19.4%
MIN. OBS. = 3%
MAX. OBS. = 65%

ALL RESPONSES

NO. OBS. = 20
MIN. OBS. = 2%
MAX. OBS. = 65%

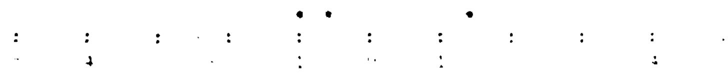
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 20.5%   STD. DEV. = 18.6%

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO DETERMINE OPERATION SEQUENCES FOR A NEW CYLINDRICAL PART

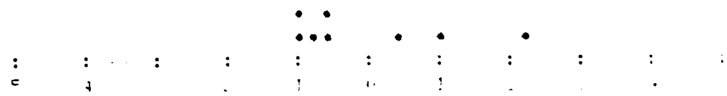
MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	20.7
STD. DEV.	=	25.7
MIN. OBS.	=	2
MAX. OBS.	=	50



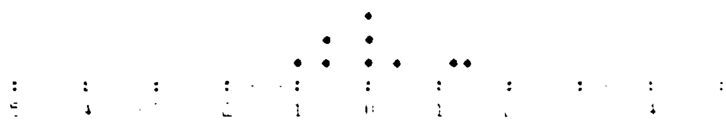
OTHER AEROSPACE

NO. OBS.	=	8
MEAN	=	20.9
STD. DEV.	=	22.3
MIN. OBS.	=	3
MAX. OBS.	=	65



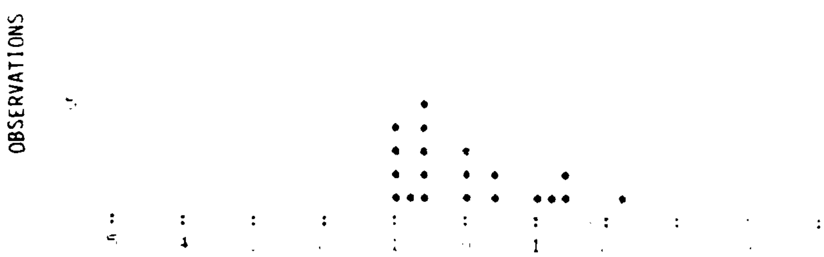
OTHER-INDUSTRY

NO. OBS.	=	9
MEAN	=	23
STD. DEV.	=	16.1
MIN. OBS.	=	2
MAX. OBS.	=	50



ALL RESPONSES

NO. OBS.	=	20
MIN. OBS.	=	2
MAX. OBS.	=	50%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 21.8 STD. DEV. = 19.1

Q15 - APPROXIMATE ANNUAL MAINTENANCE AND SUPPORT COSTS FOR CURRENTLY USED COMPUTER ASSISTED PROCESS PLANNING

MISSILE PRIMES & SUBS

NO. OBS. = 1
MEAN = $5K
STD. DEV. = $0
MIN. OBS. = $5K
MAX. OBS. = $5K

```
-                     *
 -:----:----:----:----:----:----:----:----:----:----:-
 -5   -4   -3   -2   -1    0    1    2    3    4    5
```

OTHER AEROSPACE

NO. OBS. = 1
MEAN = $20K
STD. DEV. = $0
MIN. OBS. = $20K
MAX. OBS. = $20K

```
-                       *
 -:----:----:----:----:----:----:----:----:----:----:-
 -5   -4   -3   -2   -1    0    1    2    3    4    5
```

OTHER INDUSTRY

NO. OBS. = 3
MEAN = $71K
STD. DEV. = $41K
MIN. OBS. = $24K
MAX. OBS. = $100K

```
-                       *       **
 -:----:----:----:----:----:----:----:----:----:----:-
 -5   -4   -3   -2   -1    0    1    2    3    4    5
```

ALL RESPONSES

NO. OBS. = 5
MIN. OBS. = $5K
MAX. OBS. = $100K

OBSERVATIONS

```
-                       *
-                     * *       **
 -:----:----:----:----:----:----:----:----:----:----:-
 -5   -4   -3   -2   -1    0    1    2    3    4    5
```

STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $48K   STD. DEV. = $44K

Q14 - AUTOMATION PLANNED FOR PROCESS PLANNING FUNCTIONS WITHIN THE NEXT 2 YEARS

PLANNING FUNCTION	MISSILE PRIME AND SUBS.			OTHER AEROSPACE			OTHER INDUSTRY			TOTAL		
	MANUAL	SOME AUTOMATION	FULLY AUTOMATED	MANUAL	SOME AUTOMATION	FULLY AUTOMATED	MANUAL	SOME AUTOMATION	FULLY AUTOMATED	MANUAL	SOME AUTOMATION	FULLY AUTOMATED
DETERMINE OPERATION SEQUENCES		1	1		3	0		2	2		6	3
SELECT MACHINES AND EQUIPMENT		1	1		3	0		4	1		8	2
SELECT TOOLING, GAGES, ETC.		1	1		2	0		2	2		5	3
DETERMINE PROCESSING PARAMETERS (SPEEDS, FEEDS, ETC).		1	0		3	0		3	3		7	3
DETERMINE TIME STANDARDS		2	0		4	1		3	3		9	4
ANALYZE TOLERANCES		1	0		1	0		1	1		3	1
PREPARE ROUTING SHEETS		1	0		3	1		3	3		7	4
PREPARE OPERATIONS SHEETS		1	0		3	0		2	3		6	3
PREPARE TOOL ORDERS		1	0		3	1		0	2		4	3
CONDUCT DESIGN/ PRODUCIBILITY REVIEWS		0	0		2	0		1	0		3	0

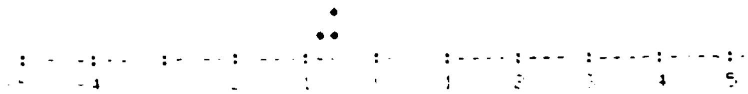
Q14 - CURRENT PROCESS PLANNING FUNCTIONS AND LEVELS OF AUTOMATION

PLANNING FUNCTION	MISSILE PRIME AND SUBS.			OTHER AEROSPACE			OTHER INDUSTRY			TOTAL		
	MANUAL	SOME AUTOMATION	FULLY AUTOMATED	MANUAL	SOME AUTOMATION	FULLY AUTOMATED	MANUAL	SOME AUTOMATION	FULLY AUTOMATED	MANUAL	SOME AUTOMATION	FULLY AUTOMATED
DETERMINE OPERATION SEQUENCES	4	0	0	6	2	0	7	0	1	17	2	1
SELECT MACHINES AND EQUIPMENT	4	0	0	6	2	0	8	0	1	18	2	1
SELECT TOOLING, GAGES, ETC.	4	0	0	8	0	0	8	0	0	20	0	0
DETERMINE PROCESSING PARAMETERS (SPEEDS, FEEDS, ETC).	4	0	0	7	0	0	7	1	1	18	1	1
DETERMINE TIME STANDARDS	4	0	0	6	1	0	6	2	1	16	3	1
ANALYZE TOLERANCES	4	0	0	7	1	0	6	0	0	17	1	0
PREPARE ROUTING SHEETS	3	1	0	3	4	1	6	2	1	12	1	2
PREPARE OPERATIONS SHEETS	3	1	0	4	2	1	5	2	1	12	5	2
PREPARE TOOL ORDERS	4	0	0	6	1	0	7	0	0	17	1	0
CONDUCT DESIGN/ PRODUCIBILITY REVIEWS	4	0	0	7	1	0	6	0	0	17	1	0

Q13 - TOTAL NUMBER OF PROCESS PLANS OF ALL TYPES PREPARED ANNUALLY FOR NON-CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 692
STD. DEV. = 299
MIN. OBS. = 350
MAX. OBS. = 906



OTHER AEROSPACE

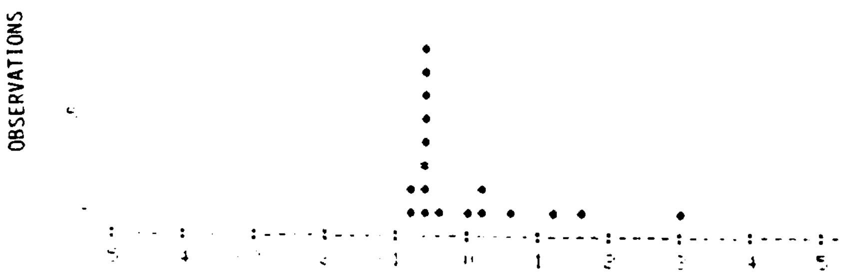
NO. OBS. = 8
MEAN = 4040
STD. DEV. = 4064
MIN. OBS. = 585
MAX. OBS. = 12100

OTHER INDUSTRY

NO. OBS. = 7
MEAN = 1867
STD. DEV. = 2228
MIN. OBS. = 100
MAX. OBS. = 6300

ALL RESPONSES

NO. OBS. = 18
MIN. OBS. = 100
MAX. OBS. = 12100

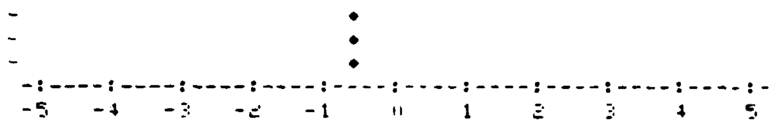


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 2637 STD. DEV. = 3225

Q13 - TOTAL NUMBER OF PROCESS PLANS OF ALL TYPES PREPARED ANNUALLY FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 422
STD. DEV. = 59
MIN. OBS. = 370
MAX. OBS. = 486

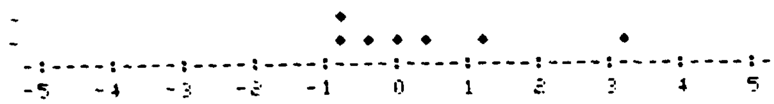


OTHER AEROSPACE

NO. OBS. = 8
MEAN = 2363
STD. DEV. = 2380
MIN. OBS. = 180
MAX. OBS. = 7600

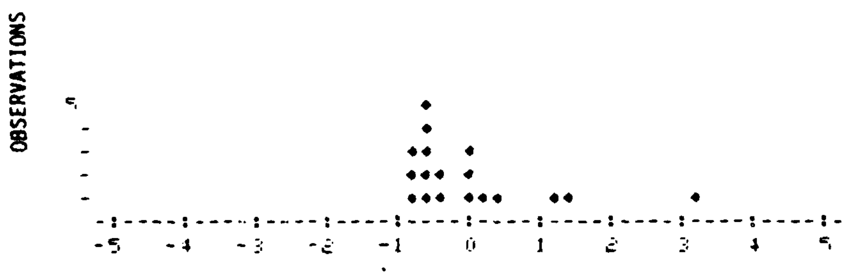
OTHER INDUSTRY

NO. OBS. = 7
MEAN = 4184
STD. DEV. = 5096
MIN. OBS. = 160
MAX. OBS. = 14350



ALL RESPONSES

NO. OBS. = 18
MIN. OBS. = 160
MAX. OBS. = 14350



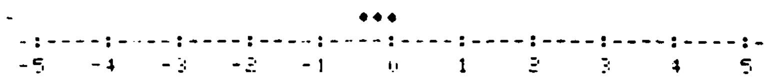
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 2748 STD. DEV. = 3657

Q13 - TOTAL NUMBER OF STUDY PLANS PREPARED ANNUALLY FOR NON-CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 383
STD. DEV. = 176
MIN. OBS. = 200
MAX. OBS. = 550

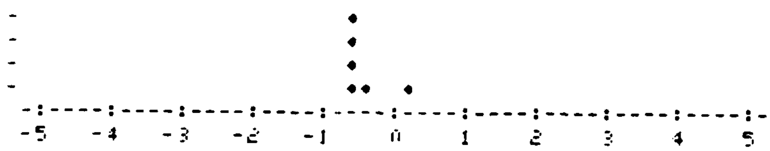


OTHER AEROSPACE

NO. OBS. = 8
MEAN = 786
STD. DEV. = 949
MIN. OBS. = 10
MAX. OBS. = 3000

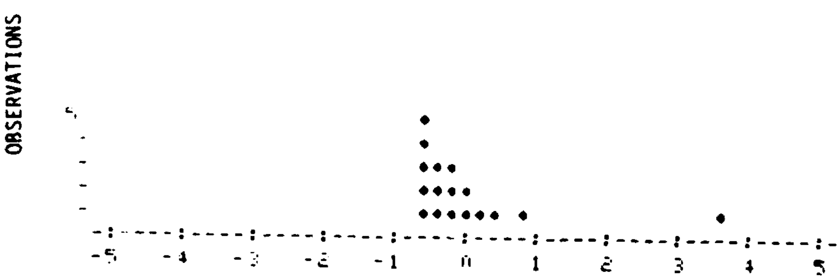
OTHER INDUSTRY

NO. OBS. = 6
MEAN = 140
STD. DEV. = 219
MIN. OBS. = 0
MAX. OBS. = 560



ALL RESPONSES

NO. OBS. = 17
MIN. OBS. = 0
MAX. OBS. = 3000



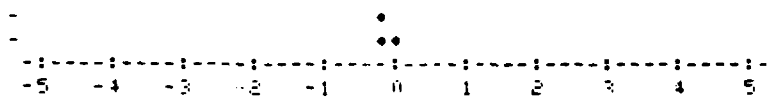
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 487 STD. DEV. = 711

Q13 - TOTAL NUMBER OF STUDY PLANS PREPARED ANNUALLY FOR CYLINDRICAL PARTS

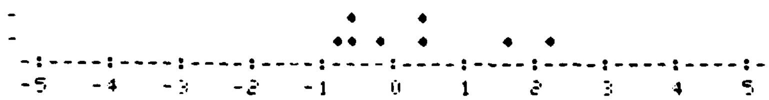
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 233
STD. DEV. = 58
MIN. OBS. = 200
MAX. OBS. = 300



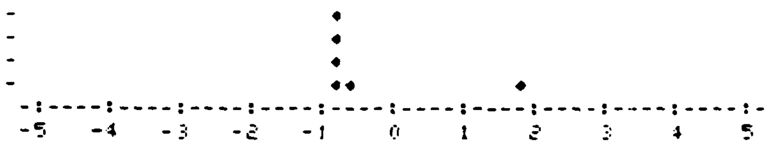
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 373
STD. DEV. = 362
MIN. OBS. = 10
MAX. OBS. = 1000



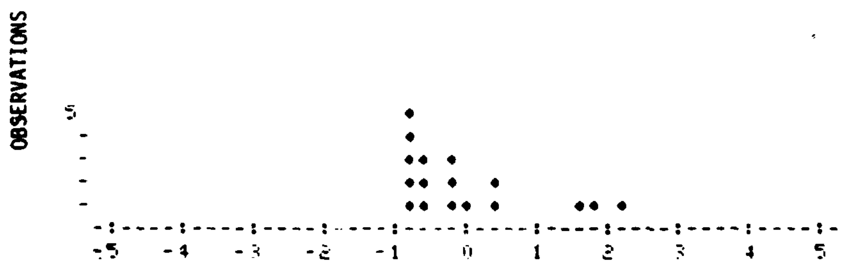
OTHER INDUSTRY

NO. OBS. = 6
MEAN = 162
STD. DEV. = 334
MIN. OBS. = 0
MAX. OBS. = 840



ALL RESPONSES

NO. OBS. = 17
MIN. OBS. = 0
MAX. OBS. = 1000



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 274 STD. DEV. = 320

Q13 - TOTAL NUMBER OF PROCESS PLANS WHICH ARE MODIFIED ANNUALLY FOR NON-CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

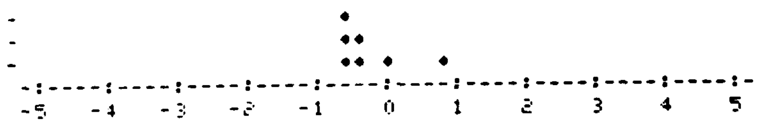
NO. OBS.	=	3
MEAN	=	65
STD. DEV.	=	41
MIN. OBS.	=	20
MAX. OBS.	=	100

OTHER AEROSPACE

NO. OBS.	=	8
MEAN	=	2133
STD. DEV.	=	2653
MIN. OBS.	=	260
MAX. OBS.	=	8100

OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	736
STD. DEV.	=	1071
MIN. OBS.	=	90
MAX. OBS.	=	3000



ALL RESPONSES

NO. OBS.	=	18
MIN. OBS.	=	20
MAX. OBS.	=	8100

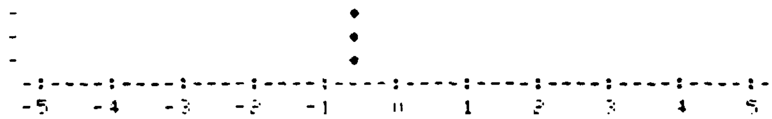
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 1245 STD. DEV. = 2007

Q13 - TOTAL NUMBER OF PROCESS PLANS WHICH ARE MODIFIED ANNUALLY FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 43
STD. DEV. = 31
MIN. OBS. = 10
MAX. OBS. = 70



OTHER AEROSPACE

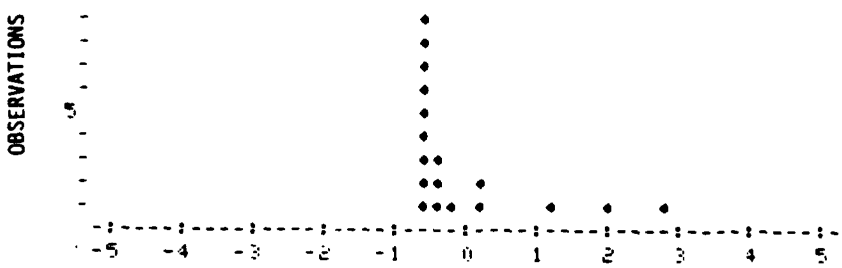
NO. OBS. = 8
MEAN = 1318
STD. DEV. = 1773
MIN. OBS. = 100
MAX. OBS. = 5400

OTHER INDUSTRY

NO. OBS. = 7
MEAN = 1770
STD. DEV. = 2677
MIN. OBS. = 50
MAX. OBS. = 7000

ALL RESPONSES

NO. OBS. = 18
MIN. OBS. = 10
MAX. OBS. = 7000



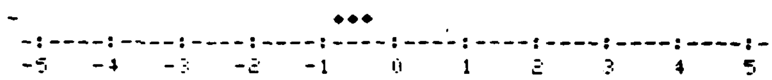
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 1281 STD. DEV. = 2047

Q13 - ANNUAL NUMBER OF PROCESS PLANS FOR NEW NON-CYLINDRICAL PARTS

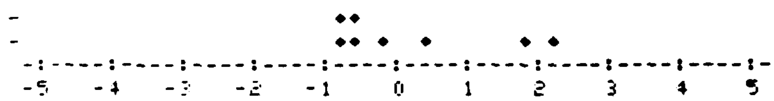
MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	244
STD. DEV.	=	163
MIN. OBS.	=	75
MAX. OBS.	=	400



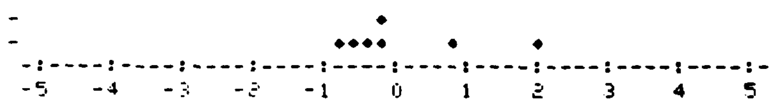
OTHER AEROSPACE

NO. OBS.	=	8
MEAN	=	1121
STD. DEV.	=	1379
MIN. OBS.	=	50
MAX. OBS.	=	3445



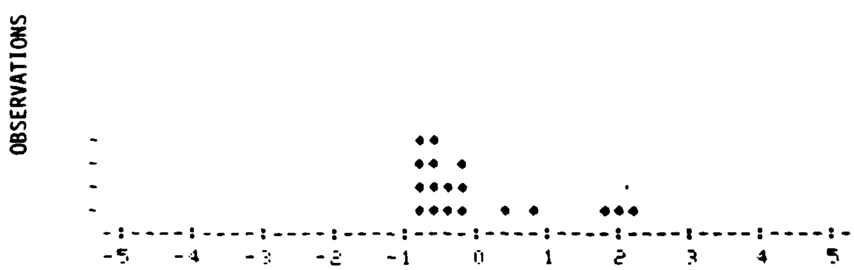
OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	1012
STD. DEV.	=	1164
MIN. OBS.	=	10
MAX. OBS.	=	3250



ALL RESPONSES

NO. OBS.	=	18
MIN. OBS.	=	10
MAX. OBS.	=	3445



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 932 STD. DEV. = 1170

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO SELECT TOOLING FOR A NEW CYLINDRICAL PART

MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	14.7%
STD. DEV.	=	5%
MIN. OBS.	=	10%
MAX. OBS.	=	20

OTHER AEROSPACE

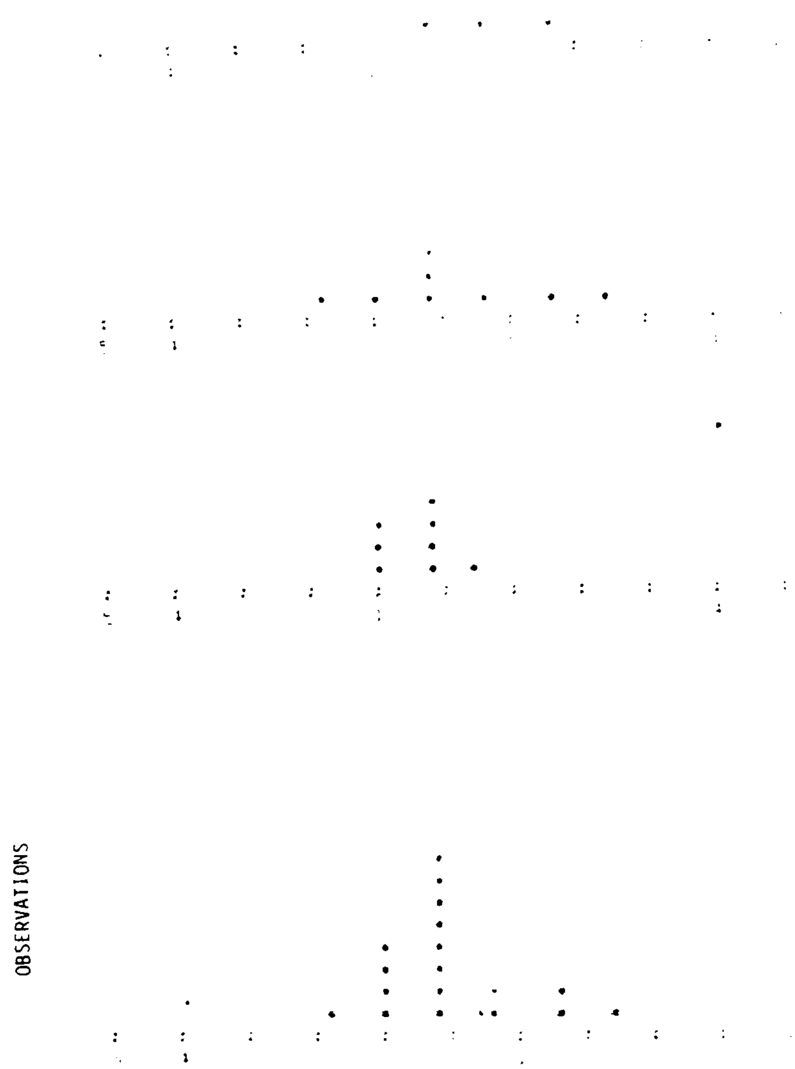
NO. OBS.	=	8
MEAN	=	11.9
STD. DEV.	=	8%
MIN. OBS.	=	0%
MAX. OBS.	=	25%

OTHER INDUSTRY

NO. OBS.	=	8
MEAN	=	8.5%
STD. DEV.	=	3.1%
MIN. OBS.	=	5%
MAX. OBS.	=	13%

ALL RESPONSES

NO. OBS.	=	19
MIN. OBS.	=	0%
MAX. OBS.	=	25%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 10.9 STD. DEV. = 6.1

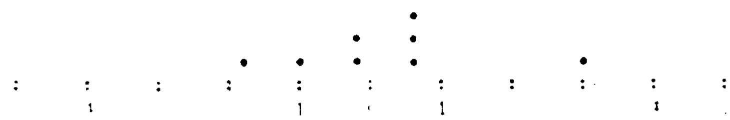
Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO SELECT TOOLING FOR A NEW NON-CYLINDRICAL PART

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 13
STD. DEV. = 2.6
MIN. OBS. = 10
MAX. OBS. = 15

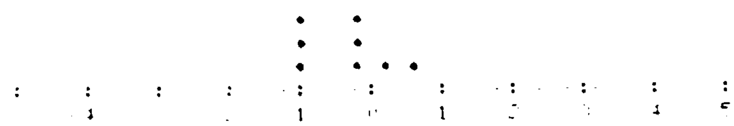
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 12.5
STD. DEV. = 8.8
MIN. OBS. = 0
MAX. OBS. = 30



OTHER INDUSTRY

NO. OBS. = 8
MEAN = 9.1
STD. DEV. = 3.8
MIN. OBS. = 5
MAX. OBS. = 15



ALL RESPONSES

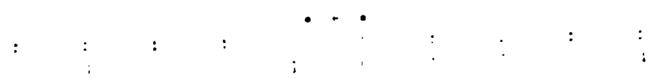
NO. OBS. = 19
MIN. OBS. = 0
MAX. OBS. = 30

STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 11.2 STD. DEV. = 6.3

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO DETERMINE PROCESSING PARAMETERS FOR A NEW CYLINDRICAL PART

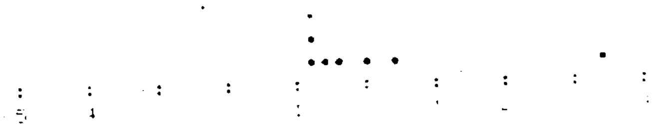
MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	4.7%
STD. DEV.	=	5.0%
MIN. OBS.	=	0%
MAX. OBS.	=	10%



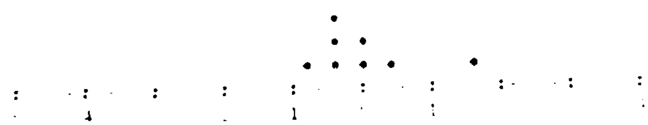
OTHER AEROSPACE

NO. OBS.	=	8
MEAN	=	10.3%
STD. DEV.	=	18.1%
MIN. OBS.	=	0%
MAX. OBS.	=	53



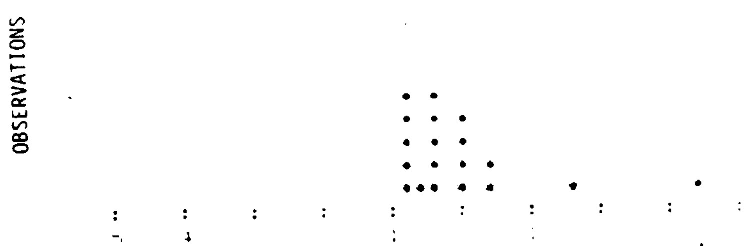
OTHER INDUSTRY

NO. OBS.	=	8
MEAN	=	10%
STD. DEV.	=	9.3%
MIN. OBS.	=	0%
MAX. OBS.	=	30%



ALL RESPONSES

NO. OBS.	=	19
MIN. OBS.	=	0%
MAX. OBS.	=	53%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 9.3% STD. DEV. = 12.9

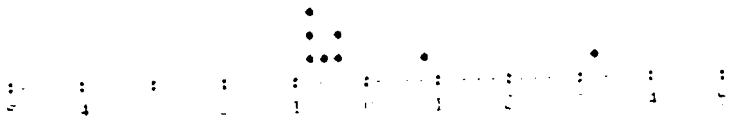
Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO DETERMINE PROCESSING PARAMETERS FOR A NEW NON-CYLINDRICAL PART

MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	6.3
STD. DEV.	=	7.8
MIN. OBS.	=	0
MAX. OBS.	=	15

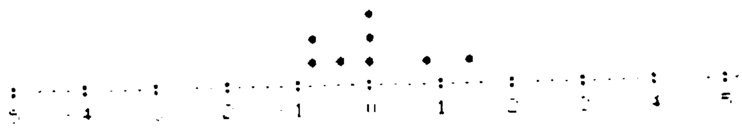
OTHER AEROSPACE

NO. OBS.	=	8
MEAN	=	10.9
STD. DEV.	=	18.3
MIN. OBS.	=	0
MAX. OBS.	=	53



OTHER INDUSTRY

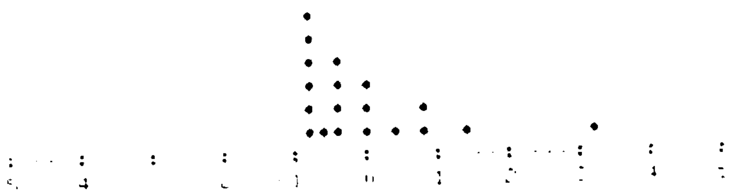
NO. OBS.	=	8
MEAN	=	10.6
STD. DEV.	=	10.2
MIN. OBS.	=	0
MAX. OBS.	=	20



ALL RESPONSES

NO. OBS.	=	19
MIN. OBS.	=	0
MAX. OBS.	=	53

OBSERVATIONS



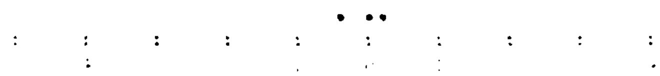
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 10.1 STD. DEV. = 13.4

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO DETERMINE TIME STANDARDS FOR A NEW CYLINDRICAL PART

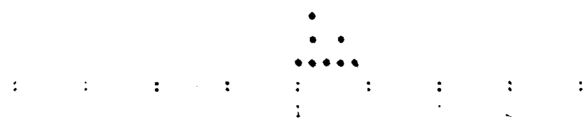
MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	7.7
STD. DEV.	=	2.5
MIN. OBS.	=	5
MAX. OBS.	=	10



OTHER AEROSPACE

NO. OBS.	=	8
MEAN	=	3.5
STD. DEV.	=	2.2
MIN. OBS.	=	0
MAX. OBS.	=	7

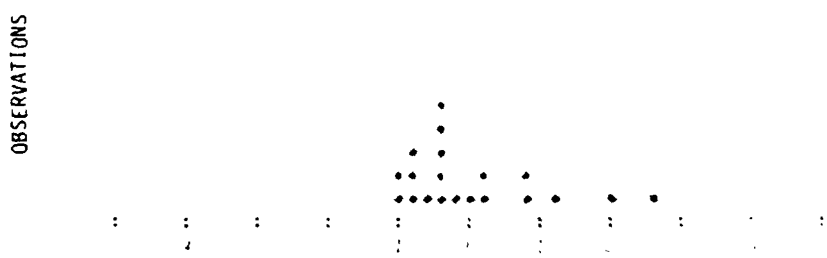


OTHER INDUSTRY

NO. OBS.	=	9
MEAN	=	13.8
STD. DEV.	=	9.6
MIN. OBS.	=	1
MAX. OBS.	=	30

ALL RESPONSES

NO. OBS.	=	20
MIN. OBS.	=	0
MAX. OBS.	=	30



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 8.8 STD. DEV. = 8.1

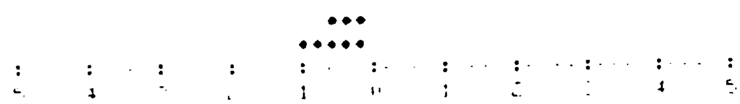
Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO DETERMINE TIME STANDARDS FOR A NEW NON-CYLINDRICAL PART

MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	6%
STD. DEV.	=	1.7%
MIN. OBS.	=	5
MAX. OBS.	=	8

OTHER AEROSPACE

NO. OBS.	=	8
MEAN	=	4
STD. DEV.	=	2.4%
MIN. OBS.	=	0%
MAX. OBS.	=	7%



OTHER INDUSTRY

NO. OBS.	=	9
MEAN	=	12.9%
STD. DEV.	=	9.6%
MIN. OBS.	=	1%
MAX. OBS.	=	25%

ALL RESPONSES

NO. OBS.	=	20
MIN. OBS.	=	0%
MAX. OBS.	=	25%

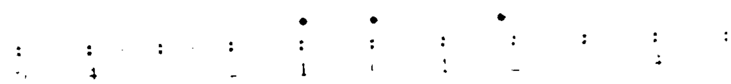
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 8.3%   STD. DEV. = 7.7%

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO ANALYZE TOLERANCES FOR A NEW CYLINDRICAL PART

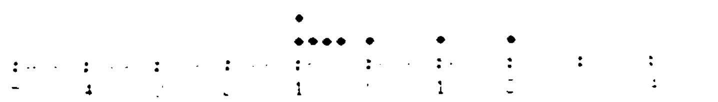
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 6.3%
STD. DEV. = 7.1%
MIN. OBS. = 0%
MAX. OBS. = 1.1%



OTHER AEROSPACE

NO. OBS. = 8
MEAN = 4.5%
STD. DEV. = 5.4%
MIN. OBS. = 0%
MAX. OBS. = 15%

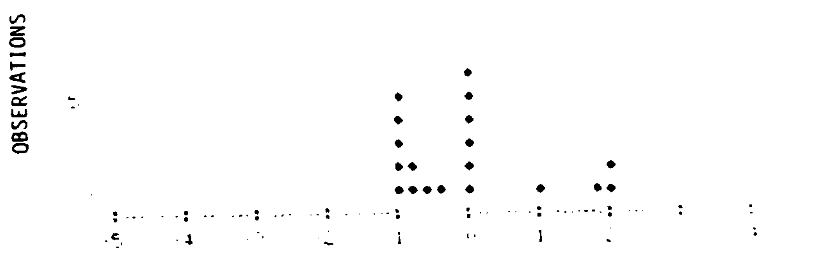


OTHER INDUSTRY

NO. OBS. = 8
MEAN = 4.5%
STD. DEV. = 4.8%
MIN. OBS. = 0%
MAX. OBS. = 15%

ALL RESPONSES

NO. OBS. = 19
MIN. OBS. = 0%
MAX. OBS. = 15%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 4.8% STD. DEV. = 5.1

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO ANALYZE TOLERANCES FOR A NEW NON-CYLINDRICAL PART

MISSILE PRIMES & SUBS

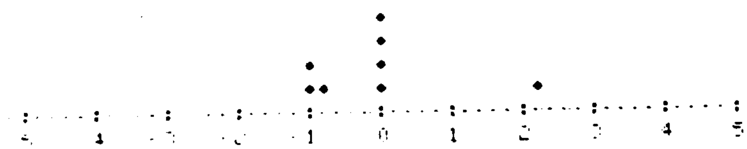
NO. OBS.	=	3
MEAN	=	6.3%
STD. DEV.	=	7.1%
MIN. OBS.	=	0%
MAX. OBS.	=	14%

OTHER AEROSPACE

NO. OBS.	=	8
MEAN	=	4.4
STD. DEV.	=	4.1%
MIN. OBS.	=	0%
MAX. OBS.	=	10%

OTHER INDUSTRY

NO. OBS.	=	8
MEAN	=	4.5%
STD. DEV.	=	4.8%
MIN. OBS.	=	0%
MAX. OBS.	=	15%



ALL RESPONSES

NO. OBS.	=	19
MIN. OBS.	=	0%
MAX. OBS.	=	15%

STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 4.7% STD. DEV. = 4.6%

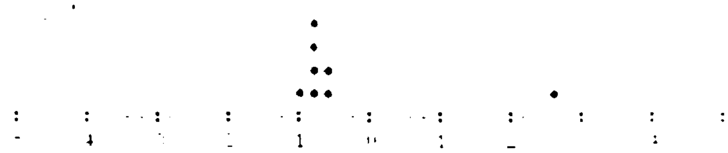
Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO PREPARE ROUTING SHEETS FOR A NEW CYLINDRICAL PART

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 15.8%
STD. DEV. = 12.2%
MIN. OBS. = 5%
MAX. OBS. = 33%

OTHER AEROSPACE

NO. OBS. = 8
MEAN = 6.1%
STD. DEV. = 11.8%
MIN. OBS. = 0%
MAX. OBS. = 35%

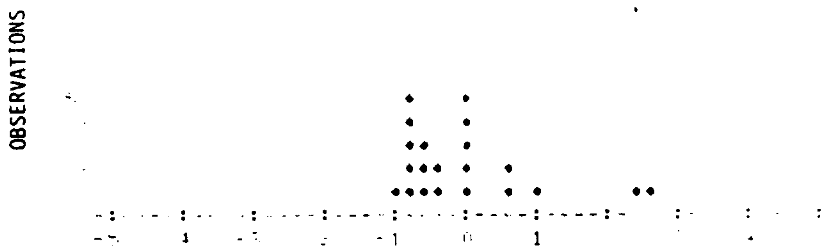


OTHER INDUSTRY

NO. OBS. = 9
MEAN = 9.6%
STD. DEV. = 5.6%
MIN. OBS. = 2%
MAX. OBS. = 20%

ALL RESPONSES

NO. OBS. = 21
MIN. OBS. = 0%
MAX. OBS. = 35%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 9.4%   STD. DEV. = 9.8

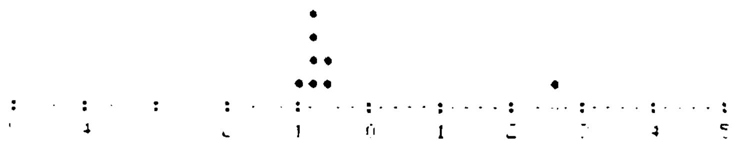
Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO PREPARE ROUTING SHEETS FOR A NEW NON-CYLINDRICAL PART

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 14.5%
STD. DEV. = 13.2%
MIN. OBS. = 5%
MAX. OBS. = 33%

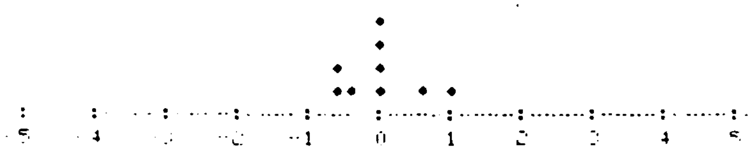
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 6.3%
STD. DEV. = 11.7%
MIN. OBS. = 0%
MAX. OBS. = 35%



OTHER INDUSTRY

NO. OBS. = 9
MEAN = 9.7%
STD. DEV. = 5.4%
MIN. OBS. = 3%
MAX. OBS. = 20%



ALL RESPONSES

NO. OBS. = 21
MIN. OBS. = 0%
MAX. OBS. = 35%

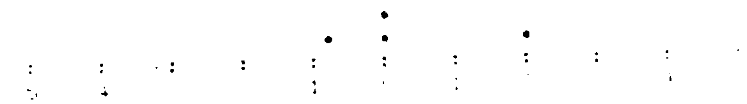
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 9.3% STD. DEV. = 9.7%

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO PREPARE OPERATION SHEETS FOR A NEW CYLINDRICAL PART

MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	19%
STD. DEV.	=	14.9%
MIN. OBS.	=	5%
MAX. OBS.	=	40%



OTHER AEROSPACE

NO. OBS.	=	8
MEAN	=	16.3%
STD. DEV.	=	13.8%
MIN. OBS.	=	0%
MAX. OBS.	=	37%

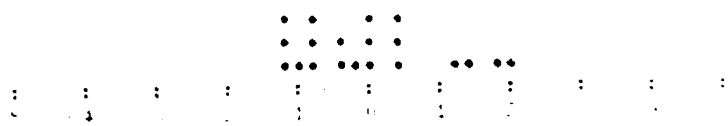
OTHER INDUSTRY

NO. OBS.	=	8
MEAN	=	11.3%
STD. DEV.	=	10.3%
MIN. OBS.	=	0%
MAX. OBS.	=	30%

OBSERVATIONS

ALL RESPONSES

NO. OBS.	=	20
MIN. OBS.	=	0%
MAX. OBS.	=	40%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 14.8% STD. DEV. = 12.4%

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO PREPARE OPERATION SHEETS FOR A NEW NON-CYLINDRICAL PART

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 21.5%
STD. DEV. = 16.9%
MIN. OBS. = 5
MAX. OBS. = 45%

OTHER AEROSPACE

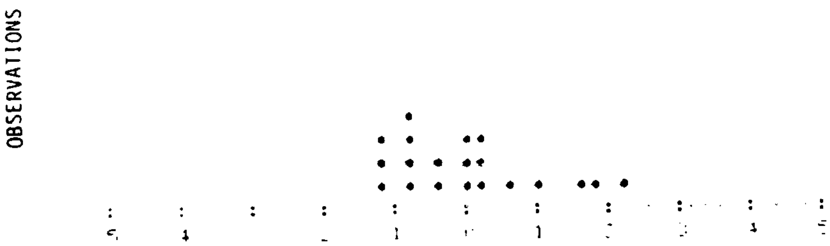
NO. OBS. = 8
MEAN = 18.3
STD. DEV. = 15.4%
MIN. OBS. = 0%
MAX. OBS. = 40%

OTHER INDUSTRY

NO. OBS. = 8
MEAN = 11.3%
STD. DEV. = 10.3%
MIN. OBS. = 0
MAX. OBS. = 20

ALL RESPONSES

NO. OBS. = 20
MIN. OBS. = 0%
MAX. OBS. = 45%



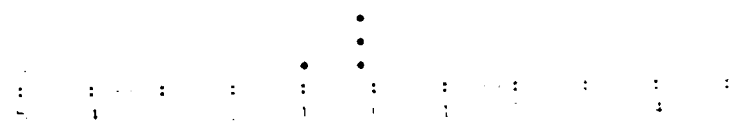
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 16.1% STD. DEV. = 13.7%

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO PREPARE TOOL ORDERS FOR A NEW CYLINDRICAL PART

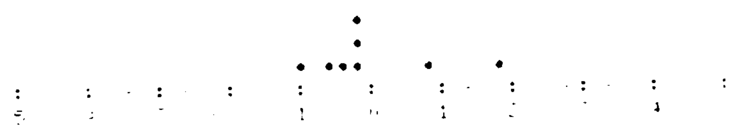
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 4%
STD. DEV. = 2%
MIN. OBS. = 1%
MAX. OBS. = 5%



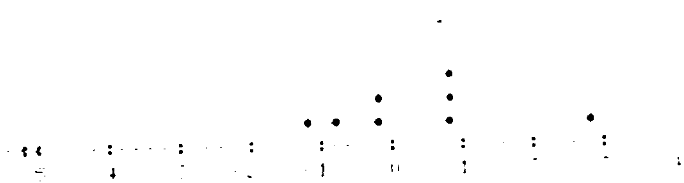
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 6%
STD. DEV. = 4.4%
MIN. OBS. = 1%
MAX. OBS. = 15%



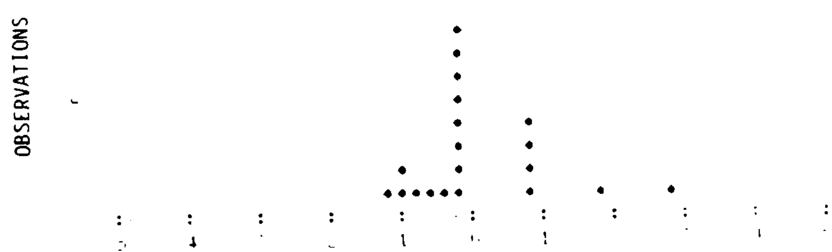
OTHER INDUSTRY

NO. OBS. = 8
MEAN = 7.8%
STD. DEV. = 6.3%
MIN. OBS. = 0%
MAX. OBS. = 20%



ALL RESPONSES

NO. OBS. = 20
MIN. OBS. = 0%
MAX. OBS. = 20%



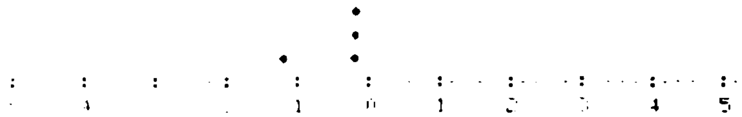
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 6.3%   STD. DEV. = 5.0%

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO PREPARE TOOL ORDERS FOR A NEW NON-CYLINDRICAL PART

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 4%
STD. DEV. = 2%
MIN. OBS. = 1%
MAX. OBS. = 5%



OTHER AEROSPACE

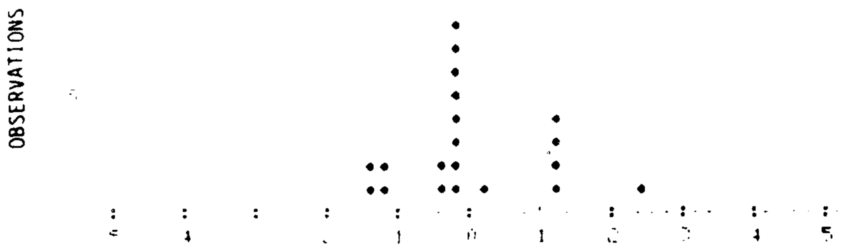
NO. OBS. = 8
MEAN = 6.9%
STD. DEV. = 4.5%
MIN. OBS. = 1%
MAX. OBS. = 15%

OTHER INDUSTRY

NO. OBS. = 8
MEAN = 5%
STD. DEV. = 3.8
MIN. OBS. = 0%
MAX. OBS. = 10%

ALL RESPONSES

NO. OBS. = 20
MIN. OBS. = 0%
MAX. OBS. = 10%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 5.6 STD. DEV. = 3.8%

AD-A151 997 COMPUTERIZED PRODUCTION PROCESS PLANNING VOLUME 3 APPENDICES A B AND C TO BENEFIT ANALYSIS(U) IIT RESEARCH INST CHICAGO IL H H SHU ET AL. NOV 76 2/4

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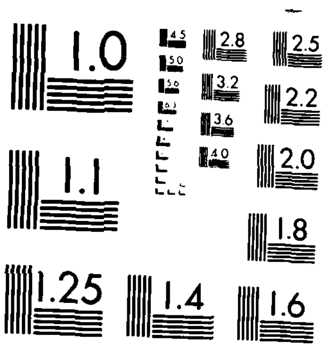


MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963 A

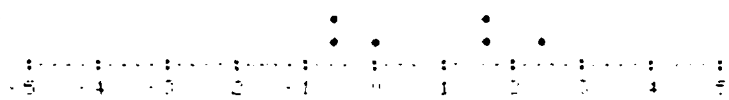
Q17 - MANHOURS TO PREPARE A PROCESS PLAN FOR A NEW CYLINDRICAL PART HAVING 10 OPERATIONS

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 11 M-H
STD. DEV. = 8 M-H
MIN. OBS. = 4 M-H
MAX. OBS. = 20 M-H

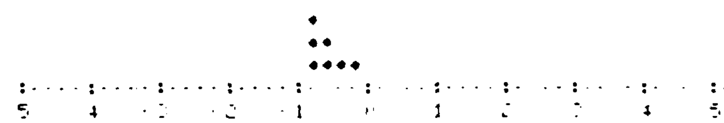
OTHER AEROSPACE

NO. OBS. = 6
MEAN = 20 M-H
STD. DEV. = 16 M-H
MIN. OBS. = 3 M-H
MAX. OBS. = 40 M-H



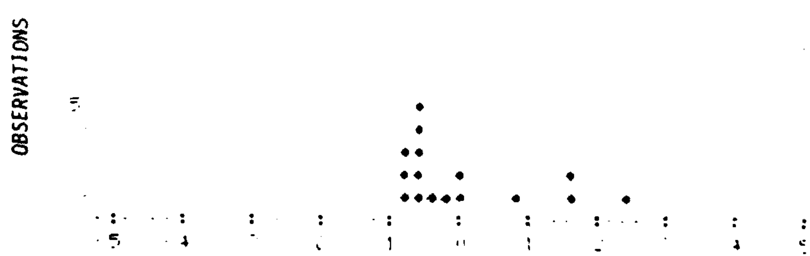
OTHER INDUSTRY

NO. OBS. = 7
MEAN = 4 M-H
STD. DEV. = 3 M-H
MIN. OBS. = 0.5 M-H
MAX. OBS. = 8 M-H



ALL RESPONSES

NO. OBS. = 16
MIN. OBS. = 0.5 M-H
MAX. OBS. = 40 M-H



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 11 M-H STD. DEV. = 12 M-H

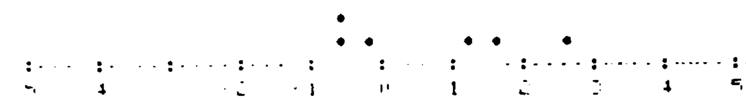
Q17 - MANHOURS TO PREPARE A PROCESS PLAN FOR A NEW CYLINDRICAL PART HAVING 25 OPERATIONS

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 33 M-H
STD. DEV. = 15 M-H
MIN. OBS. = 24 M-H
MAX. OBS. = 50 M-H

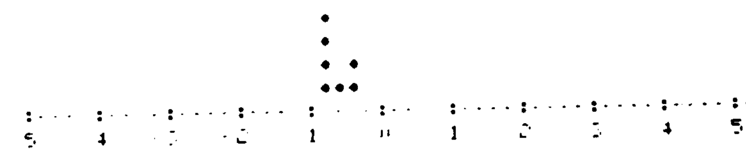
OTHER AEROSPACE

NO. OBS. = 6
MEAN = 45 M-H
STD. DEV. = 40 M-H
MIN. OBS. = 6 M-H
MAX. OBS. = 100 M-H



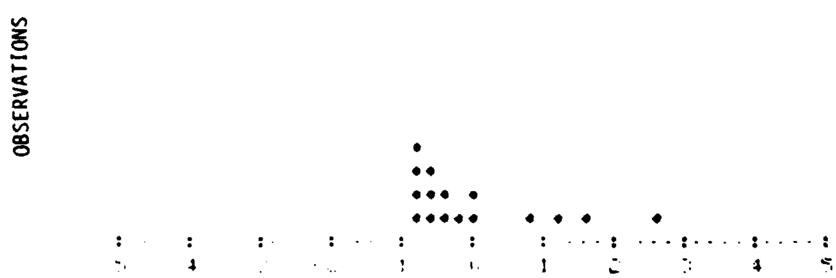
OTHER INDUSTRY

NO. OBS. = 7
MEAN = 8 M-H
STD. DEV. = 6 M-H
MIN. OBS. = 1 M-H
MAX. OBS. = 16 M-H



ALL RESPONSES

NO. OBS. = 16
MIN. OBS. = 1 M-H
MAX. OBS. = 100 M-H



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 26 M-H STD. DEV. = 29 M-H

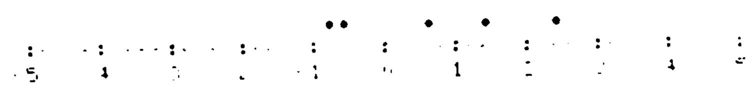
Q17 - MAN HOURS TO PREPARE A PROCESS PLAN FOR A NEW CYLINDRICAL MACHINED PART HAVING 50 OPERATIONS

MISSILE PRIMES & SUBS

NO. OBS. = 2
MEAN = 55 M-H
STD. DEV. = 7 M-H
MIN. OBS. = 50 M-H
MAX. OBS. = 60 M-H

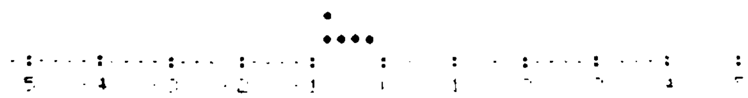
OTHER AEROSPACE

NO. OBS. = 5
MEAN = 97 M-H
STD. DEV. = 81 M-H
MIN. OBS. = 12 M-H
MAX. OBS. = 200 M-H



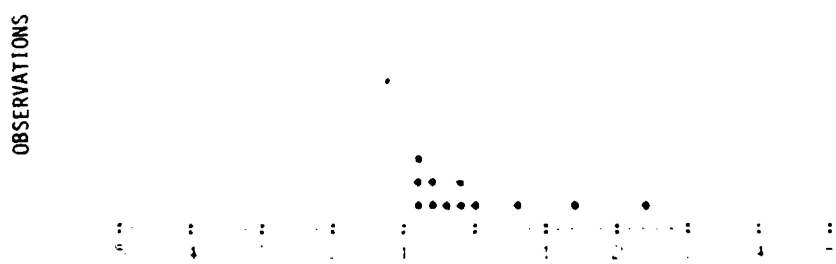
OTHER INDUSTRY

NO. OBS. = 5
MEAN = 21 M-H
STD. DEV. = 15 M-H
MIN. OBS. = 6 M-H
MAX. OBS. = 40 M-H



ALL RESPONSES

NO. OBS. = 12
MIN. OBS. = 6 M-H
MAX. OBS. = 200 M-H



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 58 M-H STD. DEV. = 61 M-H

Q17 - MANHOURS TO PREPARE A PROCESS PLAN FOR A NEW NON-CYLINDRICAL PART HAVING 10 OPERATIONS

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 19 M-H
STD. DEV. = 19 M-H
MIN. OBS. = 6 M-H
MAX. OBS. = 40 M-H

OTHER AEROSPACE

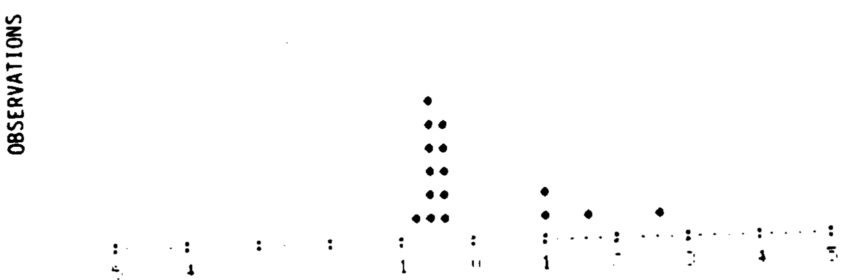
NO. OBS. = 6
MEAN = 30 M-H
STD. DEV. = 29 M-H
MIN. OBS. = 4 M-H
MAX. OBS. = 73 M-H

OTHER INDUSTRY

NO. OBS. = 7
MEAN = 4 M-H
STD. DEV. = 3 M-H
MIN. OBS. = 0.5 M-H
MAX. OBS. = 10 M-H

ALL RESPONSES

NO. OBS. = 16
MIN. OBS. = 0.5 M-H
MAX. OBS. = 73 M-H



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 17 M-H STD. DEV. = 22 M-H

Q17 - MANHOURS TO PREPARE A PROCESS PLAN FOR A NEW NON-CYLINDRICAL PART HAVING 25 OPERATIONS

MISSILE PRIMES & SUBS

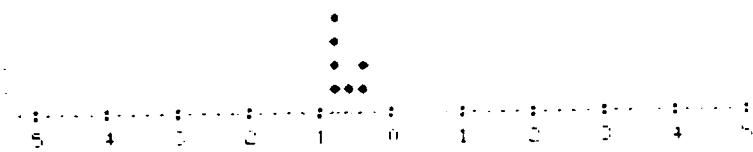
NO. OBS. = 3
MEAN = 55 M-H
STD. DEV. = 40 M-H
MIN. OBS. = 25 M-H
MAX. OBS. = 100 M-H

OTHER AEROSPACE

NO. OBS. = 6
MEAN = 67 M-H
STD. DEV. = 63 M-H
MIN. OBS. = 6 M-H
MAX. OBS. = 140 M-H

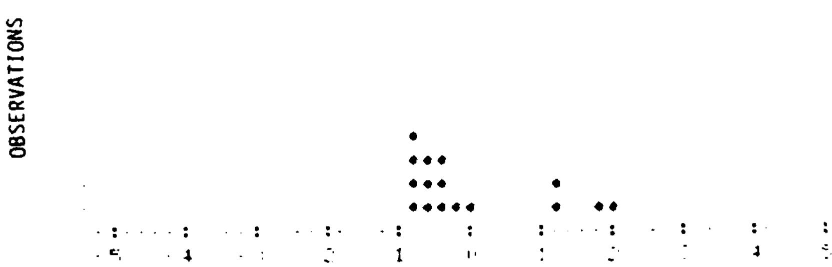
OTHER INDUSTRY

NO. OBS. = 7
MEAN = 8 M-H
STD. DEV. = 7 M-H
MIN. OBS. = 1 M-H
MAX. OBS. = 20 M-H



ALL RESPONSES

NO. OBS. = 16
MIN. OBS. = 1 M-H
MAX. OBS. = 140 M-H

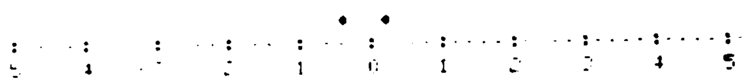


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 39 M-H STD. DEV. =49 M-H

Q17 - MAN HOURS TO PREPARE A PROCESS PLAN FOR A NEW NON-CYLINDRICAL MACHINED PART HAVING 50 OPERATIONS

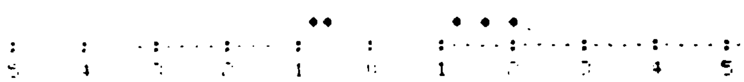
MISSILE PRIMES & SUBS

NO. OBS. = 2
MEAN = 75 M-H
STD. DEV. = 35 M-H
MIN. OBS. = 50 M-H
MAX. OBS. = 100 M-H



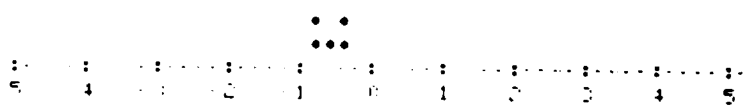
OTHER AEROSPACE

NO. OBS. = 5
MEAN = 157 M-H
STD. DEV. = 128 M-H
MIN. OBS. = 12 M-H
MAX. OBS. = 300 M-H



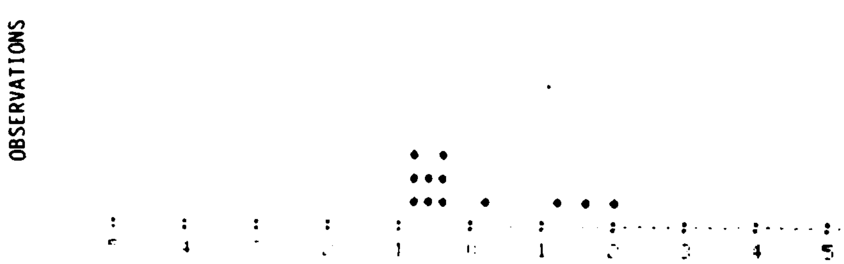
OTHER INDUSTRY

NO. OBS. = 5
MEAN = 23 M-H
STD. DEV. = 17 M-H
MIN. OBS. = 6 M-H
MAX. OBS. = 40 M-H



ALL RESPONSES

NO. OBS. = 12
MIN. OBS. = 6 M-H
MAX. OBS. = 300 M-H



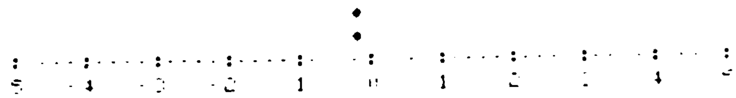
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 87 M-H STD. DEV. = 102 M-H

Q17 - COST TO PREPARE A PROCESS PLAN FOR A NEW CYLINDRICAL PART HAVING 10 OPERATIONS

MISSILE PRIMES & SUBS

NO. OBS.	= 2
MEAN	= $ 123
STD. DEV.	= $ 4
MIN. OBS.	= $ 120
MAX. OBS.	= $ 125

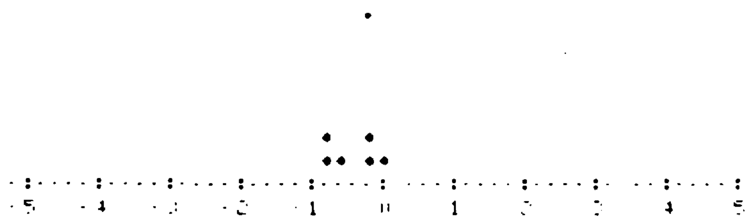


OTHER AEROSPACE

NO. OBS.	= 5
MEAN	= $ 231
STD. DEV.	= $ 210
MIN. OBS.	= $ 60
MAX. OBS.	= $ 567

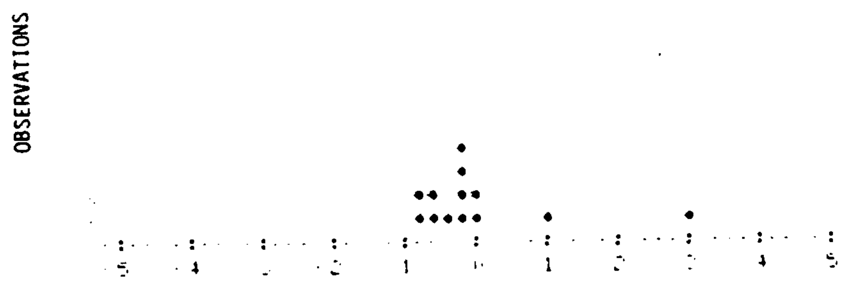
OTHER INDUSTRY

NO. OBS.	= 6
MEAN	= $ 78
STD. DEV.	= $ 53
MIN. OBS.	= $ 18
MAX. OBS.	= $ 150



ALL RESPONSES

NO. OBS.	= 13
MIN. OBS.	= $ 18
MAX. OBS.	= $ 567



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $ 144 STD. DEV. = $ 146

Q17 - COST TO PREPARE A PROCESS PLAN FOR A NEW CYLINDRICAL PART HAVING 25 OPERATIONS

MISSILE PRIMES & SUBS

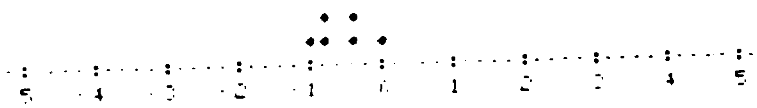
NO. OBS. = 2
MEAN = $525
STD. DEV. = $318
MIN. OBS. = $30
MAX. OBS. = $750

OTHER AEROSPACE

NO. OBS. = 5
MEAN = $658
STD. DEV. = $565
MIN. OBS. = $120
MAX. OBS. = $1418

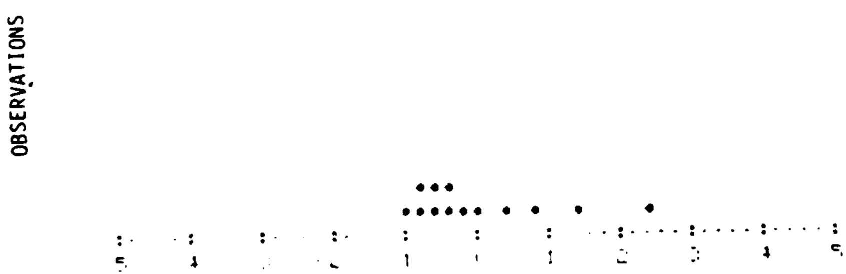
OTHER INDUSTRY

NO. OBS. = 6
MEAN = $159
STD. DEV. = $137
MIN. OBS. = $18
MAX. OBS. = $375



ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = $18
MAX. OBS. = $1418



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $407 STD. DEV. = $427

Q17 - COST TO PREPARE A PROCESS PLAN FOR A NEW CYLINDRICAL PART HAVING 50 OPERATIONS

MISSILE PRIMES & SUBS

NO. OBS.	=	2
MEAN	=	$1225
STD. DEV.	=	$ 884
MIN. OBS.	=	$ 680
MAX. OBS.	=	$1850

OTHER AEROSPACE

NO. OBS.	=	4
MEAN	=	$1320
STD. DEV.	=	$1192
MIN. OBS.	=	$ 264
MAX. OBS.	=	$2836

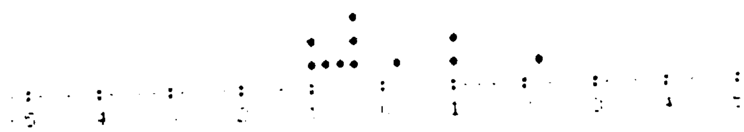
OTHER INDUSTRY

NO. OBS.	=	5
MEAN	=	$ 409
STD. DEV.	=	$ 377
MIN. OBS.	=	$ 75
MAX. OBS.	=	$1000

OBSERVATIONS

ALL RESPONSES

NO. OBS.	=	11
MIN. OBS.	=	$ 75
MAX. OBS.	=	$2836



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $ 887 STD. DEV. = $879

Q17 - COST TO PREPARE A PROCESS PLAN FOR A NEW NON-CYLINDRICAL PART HAVING 10 OPERATIONS

MISSILE PRIMES & SUBS

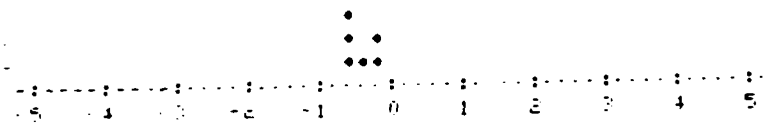
NO. OBS. = 2
MEAN = $ 160
STD. DEV. = $ 57
MIN. OBS. = $ 120
MAX. OBS. = $ 200

OTHER AEROSPACE

NO. OBS. = 5
MEAN = $ 455
STD. DEV. = $ 482
MIN. OBS. = $ 80
MAX. OBS. = $1240

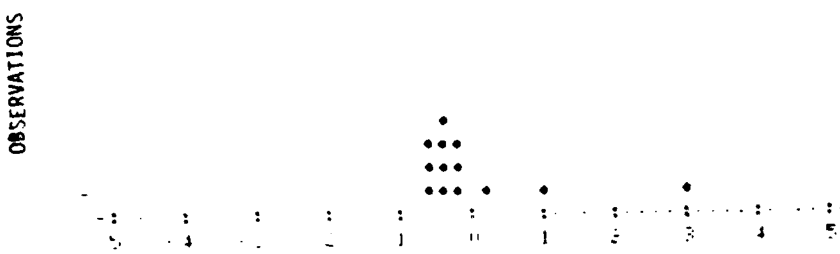
OTHER INDUSTRY

NO. OBS. = 6
MEAN = $ 83
STD. DEV. = $ 59
MIN. OBS. = $ 18
MAX. OBS. = $ 150



ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = $ 18
MAX. OBS. = $1240



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $ 238 STD. DEV. = $ 334

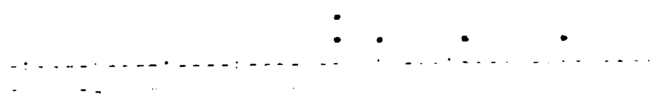
Q17 - COST TO PREPARE A PROCESS PLAN FOR A NEW NON-CYLINDRICAL PART HAVING 25 OPERATIONS

MISSILE PRIMES & SUBS

NO. OBS. = 2
MEAN = $775
STD. DEV. = $672
MIN. OBS. = $300
MAX. OBS. = $1250

OTHER AEROSPACE

NO. OBS. = 5
MEAN = $938
STD. DEV. = $959
MIN. OBS. = $132
MAX. OBS. = $2380

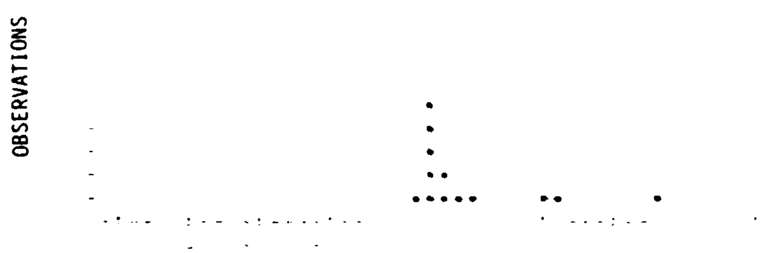


OTHER INDUSTRY

NO. OBS. = 6
MEAN = $173
STD. DEV. = $143
MIN. OBS. = $18
MAX. OBS. = $375

ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = $18
MAX. OBS. = $2380



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $560 STD. DEV. = $704

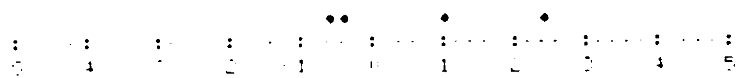
Q17 - COST TO PREPARE A PROCESS PLAN FOR A NEW NON-CYLINDRICAL PART HAVING 50 OPERATIONS

MISSILE PRIMES & SUBS

NO. OBS.	=	2
MEAN	=	$1850
STD. DEV.	=	$1768
MIN. OBS.	=	$600
MAX. OBS.	=	$2100

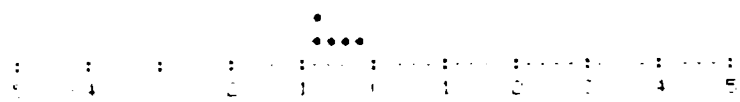
OTHER AEROSPACE

NO. OBS.	=	4
MEAN	=	$2221
STD. DEV.	=	$2223
MIN. OBS.	=	$308
MAX. OBS.	=	$5100



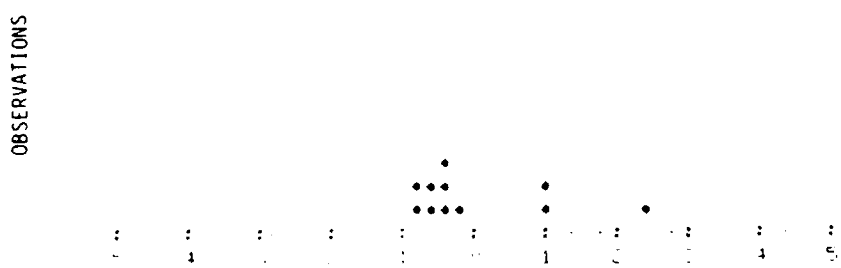
OTHER INDUSTRY

NO. OBS.	=	5
MEAN	=	$439
STD. DEV.	=	$380
MIN. OBS.	=	$75
MAX. OBS.	=	$1000



ALL RESPONSES

NO OBS.	=	11
MIN. OBS.	=	$75
MAX. OBS.	=	$5100



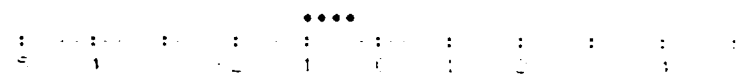
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $1344 STD. DEV. = $1619

Q19 - PERCENTAGE OF COSTS ATTRIBUTABLE TO MATERIAL FOR NON-CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	11.8%
STD. DEV.	=	5.6%
MIN. OBS.	=	5.0%
MAX. OBS.	=	18.0%

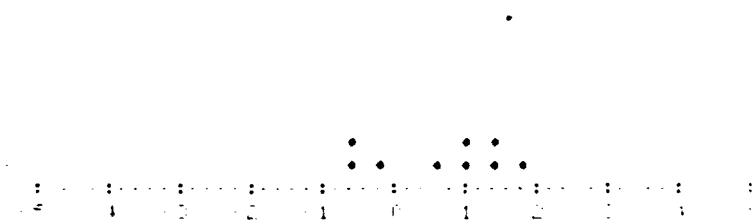


OTHER AEROSPACE

NO. OBS.	=	4
MEAN	=	9.0%
STD. DEV.	=	7.6%
MIN. OBS.	=	1.8%
MAX. OBS.	=	19.2%

OTHER INDUSTRY

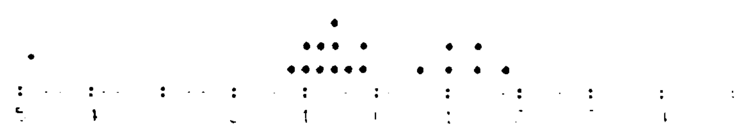
NO. OBS.	=	9
MEAN	=	36.8%
STD. DEV.	=	17.3%
MIN. OBS.	=	12.0%
MAX. OBS.	=	60.0%



ALL RESPONSES

NO. OBS.	=	17
MIN. OBS.	=	1.8%
MAX. OBS.	=	60.0%

OBSERVATIONS



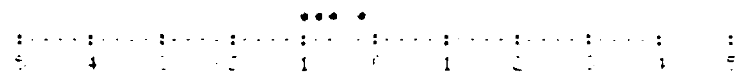
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 24.4 STD. DEV. = 18.8

Q19 - PERCENTAGE OF COSTS ATTRIBUTABLE TO MATERIAL FOR CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

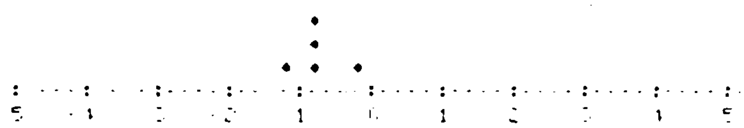
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 11.8%
STD. DEV. = 5.6%
MIN. OBS. = 5%
MAX. OBS. = 18%



OTHER AEROSPACE

NO. OBS. = 5
MEAN = 10.2%
STD. DEV. = 6.2%
MIN. OBS. = 1.8%
MAX. OBS. = 19.2

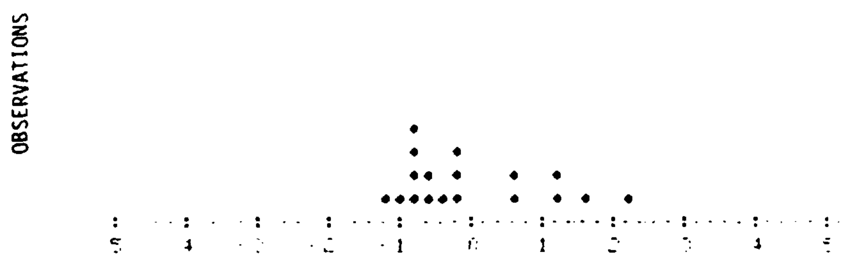


OTHER INDUSTRY

NO. OBS. = 9
MEAN = 35.2%
STD. DEV. = 16.6%
MIN. OBS. = 12.0%
MAX. OBS. = 60.0%

ALL RESPONSES

NO. OBS. = 18
MIN. OBS. = 1.8%
MAX. OBS. = 60.0%

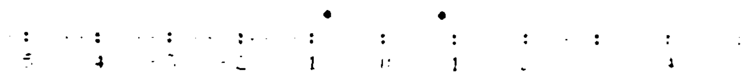


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 23.0% STD. DEV. = 17.3%

Q18 - AVERAGE COST TO PREPARE A PROCESS PLAN FOR STUDY PURPOSES -- NON-CYLINDRICAL PARTS

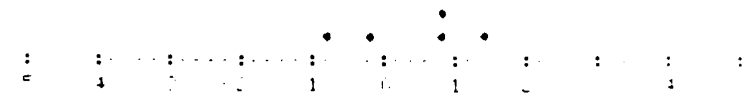
MISSILE PRIMES & SUBS

NO. OBS.	=	2
MEAN	=	$118
STD. DEV.	=	$116
MIN. OBS.	=	$ 36
MAX. OBS.	=	$200



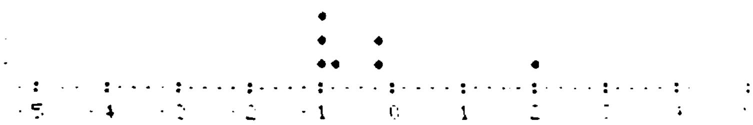
OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	$157
STD. DEV.	=	$ 81
MIN. OBS.	=	$ 50
MAX. OBS.	=	$250



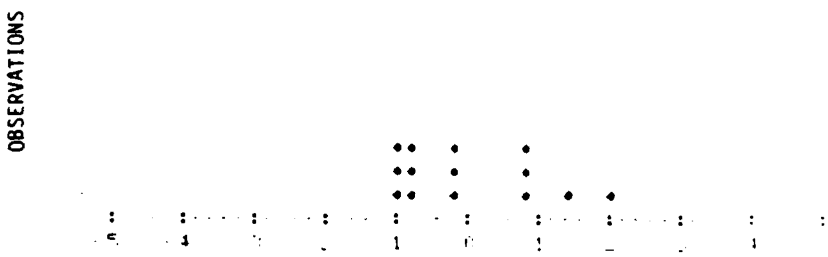
OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	$ 87
STD. DEV.	=	$ 99
MIN. OBS.	=	$ 16
MAX. OBS.	=	$300



ALL RESPONSES

NO. OBS.	=	14
MIN. OBS.	=	$ 16
MAX. OBS.	=	$300



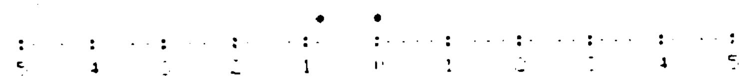
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $ 116.6 STD. DEV. = $ 93.1

Q18 - AVERAGE COST TO PREPARE A PROCESS PLAN FOR STUDY PURPOSES -- CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 2
MEAN = \$ 80.5
STD. DEV. = \$ 63
MIN. OBS. = \$ 36
MAX. OBS. = \$125

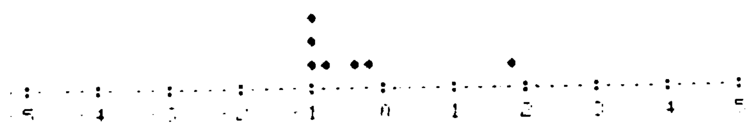


OTHER AEROSPACE

NO. OBS. = 5
MEAN = \$194
STD. DEV. = \$ 87
MIN. OBS. = \$ 80
MAX. OBS. = \$300

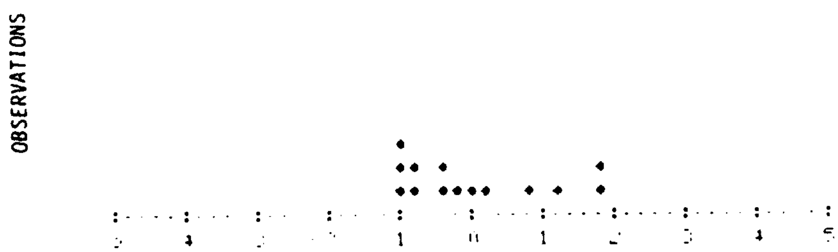
OTHER INDUSTRY

NO. OBS. = 7
MEAN = \$ 89
STD. DEV. = \$ 99
MIN. OBS. = \$ 16
MAX. OBS. = \$300



ALL RESPONSES

NO. OBS. = 14
MIN. OBS. = \$ 16
MAX. OBS. = \$300



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$ 124 STD. DEV. = \$ 100.4

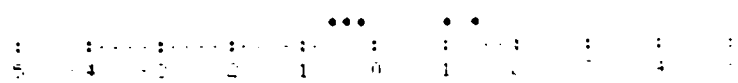
Q18 - AVERAGE COST TO MODIFY AN EXISTING PROCESS PLAN -- NON-CYLINDRICAL MACHINED PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = $170
STD. DEV. = $132
MIN. OBS. = $36
MAX. OBS. = $300

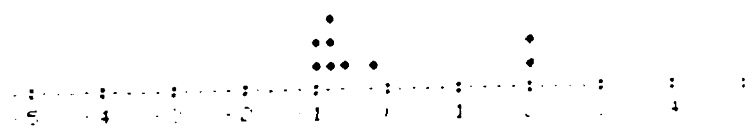
OTHER AEROSPACE

NO. OBS. = 5
MEAN = $217
STD. DEV. = $147
MIN. OBS. = $85
MAX. OBS. = $400



OTHER INDUSTRY

NO. OBS. = 9
MEAN = $149
STD. DEV. = $203.2
MIN. OBS. = $10
MAX. OBS. = $500



ALL RESPONSES

NO. OBS. = 17
MIN. OBS. = $10
MAX. OBS. = $500

STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $173 STD. DEV. = $171

Q18 - AVERAGE COST TO MODIFY AN EXISTING PROCESS PLAN -- CYLINDRICAL MACHINED PARTS

MISSILE PRIMES & SUBS

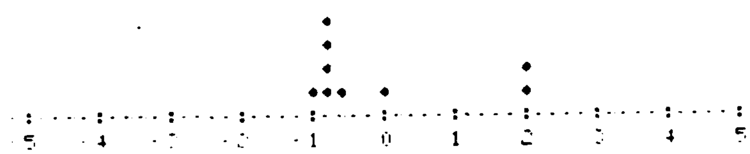
NO. OBS. = 3
MEAN = $112
STD. DEV. = $83
MIN. OBS. = $36
MAX. OBS. = $200

OTHER AEROSPACE

NO. OBS. = 5
MEAN = $228
STD. DEV. = $143
MIN. OBS. = $70
MAX. OBS. = $400

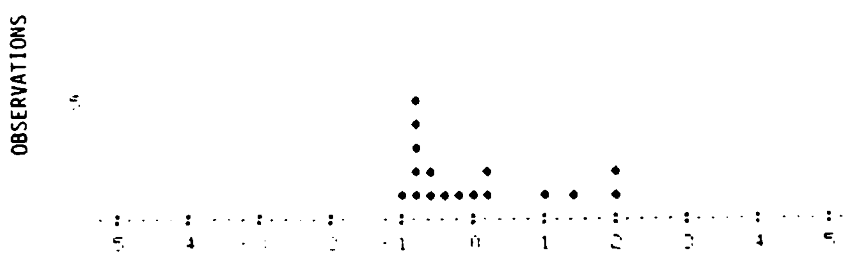
OTHER INDUSTRY

NO. OBS. = 9
MEAN = $149
STD. DEV. = $204
MIN. OBS. = $10
MAX. OBS. = $500



ALL RESPONSES

NO. OBS. = 17
MIN. OBS. = $10
MAX. OBS. = $500



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $166 STD. DEV. = $169

Q18 - AVERAGE COST TO PREPARE A PROCESS PLAN FOR A NEW PART -- NON-CYLINDRICAL MACHINED PARTS

MISSILE PRIMES & SUBS

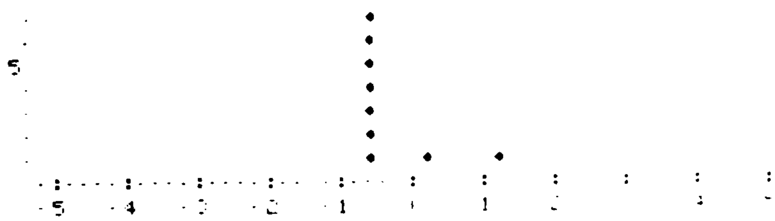
NO. OBS.	=	3
MEAN	=	$547
STD. DEV.	=	$401
MIN. OBS.	=	$240
MAX. OBS.	=	$1000

OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	$1366
STD. DEV.	=	$1537
MIN. OBS.	=	$210
MAX. OBS.	=	$4000

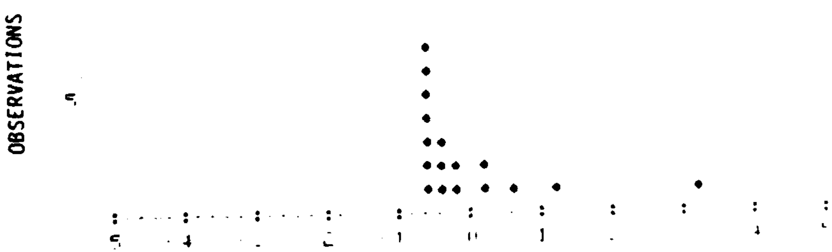
OTHER INDUSTRY

NO. OBS.	=	9
MEAN	=	$399
STD. DEV.	=	$675
MIN. OBS.	=	$ 18
MAX. OBS.	=	$2000



ALL RESPONSES

NO. OBS.	=	17
MIN. OBS.	=	$ 18
MAX. OBS.	=	$4000



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $709 STD. DEV. = $1016

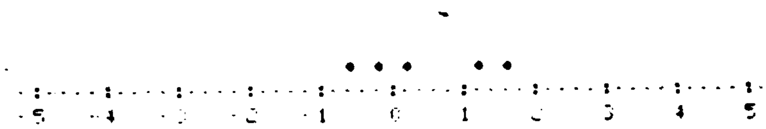
Q18 - AVERAGE COST TO PREPARE A PROCESS PLAN FOR A NEW PART -- CYLINDRICAL MACHINED PARTS

MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	$330
STD. DEV.	=	$147
MIN. OBS.	=	$240
MAX. OBS.	=	$500

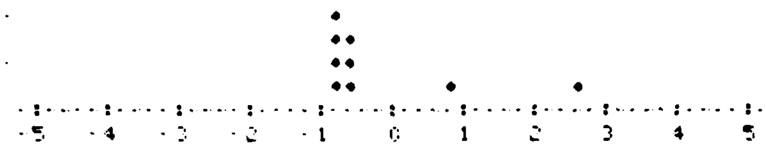
OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	$760
STD. DEV.	=	$529
MIN. OBS.	=	$180
MAX. OBS.	=	$1413



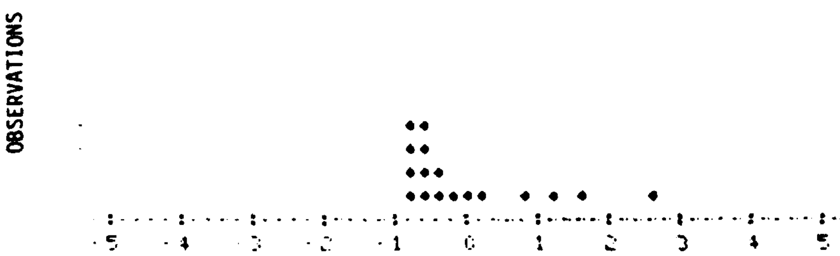
OTHER INDUSTRY

NO. OBS.	=	9
MEAN	=	$398
STD. DEV.	=	$675
MIN. OBS.	=	$ 25
MAX. OBS.	=	$2000



ALL RESPONSES

NO. OBS.	=	17
MIN. OBS.	=	$ 25
MAX. OBS.	=	$2000



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $492 STD. DEV. = $577

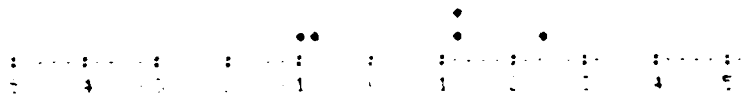
Q17 - LEADTIME TO PREPARE A PROCESS PLAN FOR A NEW NON-CYLINDRICAL PART HAVING 50 OPERATIONS

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 27 DAYS
STD. DEV. = 6 DAYS
MIN. OBS. = 20 DAYS
MAX. OBS. = 30 DAYS

OTHER AEROSPACE

NO. OBS. = 5
MEAN = 44 DAYS
STD. DEV. = 38 DAYS
MIN. OBS. = 2 DAYS
MAX. OBS. = 90 DAYS



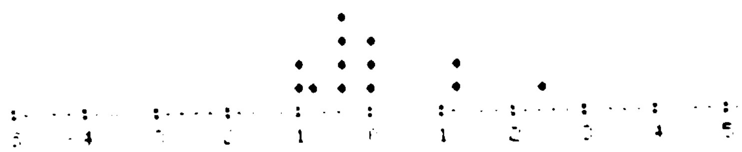
OTHER INDUSTRY

NO. OBS. = 5
MEAN = 18 DAYS
STD. DEV. = 10 DAYS
MIN. OBS. = 2 DAYS
MAX. OBS. = 28 DAYS

OBSERVATIONS

ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = 2 DAYS
MAX. OBS. = 90 DAYS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 30 DAYS STD. DEV. = 26 DAYS

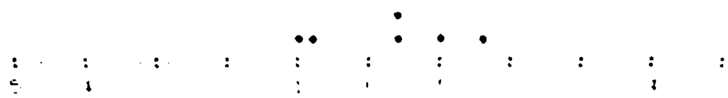
Q17 - LEADTIME TO PREPARE A PROCESS PLAN FOR A NEW NON-CYLINDRICAL PART HAVING 25 OPERATIONS

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 35 DAYS
STD. DEV. = 37 DAYS
MIN. OBS. = 10 DAYS
MAX. OBS. = 90 DAYS

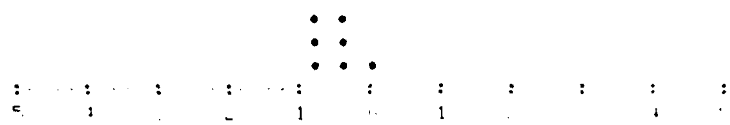
OTHER AEROSPACE

NO. OBS. = 6
MEAN = 29 DAYS
STD. DEV. = 23 DAYS
MIN. OBS. = 1 DAY
MAX. OBS. = 60 DAYS



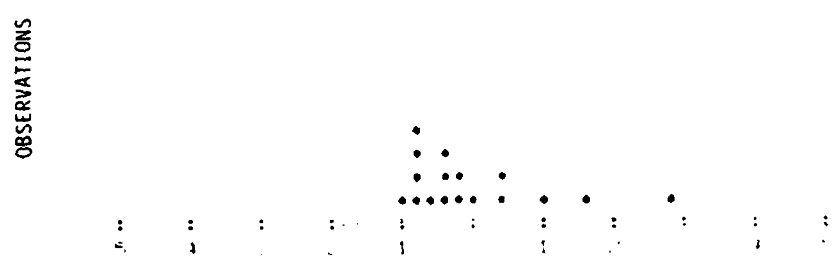
OTHER INDUSTRY

NO. OBS. = 7
MEAN = 10 DAYS
STD. DEV. = 8 DAYS
MIN. OBS. = 2 DAYS
MAX. OBS. = 21 DAYS



ALL RESPONSES

NO. OBS. = 17
MIN. OBS. = 1 DAY
MAX. OBS. = 90 DAYS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 23 DAYS STD. DEV. = 24 DAYS

Q17 - LEADTIME TO PREPARE A PROCESS PLAN FOR A NEW NON-CYLINDRICAL PART HAVING 10 OPERATIONS

MISSILE PRIMES & SUBS

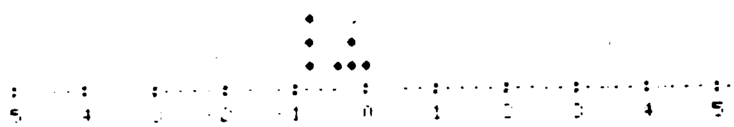
NO. OBS.	=	4
MEAN	=	22 days
STD. DEV.	=	26 days
MIN. OBS.	=	1 day
MAX. OBS.	=	60 days

OTHER AEROSPACE

NO. OBS.	=	6
MEAN	=	17 days
STD. DEV.	=	14 days
MIN. OBS.	=	0.5 days
MAX. OBS.	=	35 days

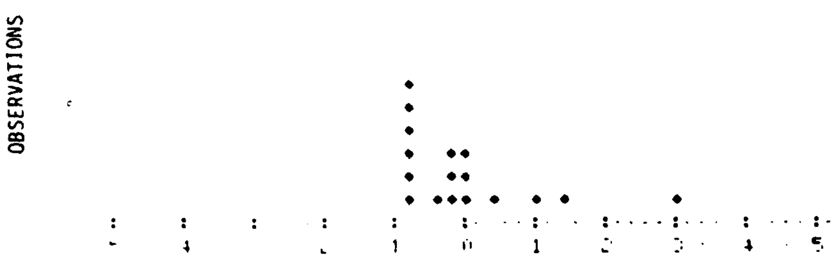
OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	7 days
STD. DEV.	=	5 days
MIN. OBS.	=	2 days
MAX. OBS.	=	14 days



ALL RESPONSES

NO. OBS.	=	17
MIN. OBS.	=	0.5 days
MAX. OBS.	=	60 days



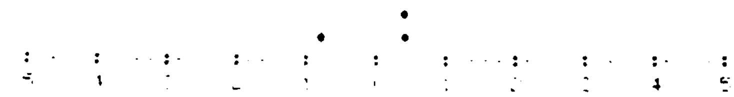
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 14 days STD. DEV. = 15 days

Q17 - LEADTIME TO PREPARE A PROCESS PLAN FOR A NEW CYLINDRICAL PART HAVING 50 OPERATIONS

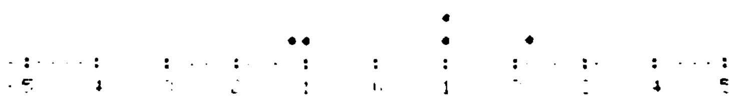
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 23 DAYS
STD. DEV. = 12 DAYS
MIN. OBS. = 10 DAYS
MAX. OBS. = 30 DAYS



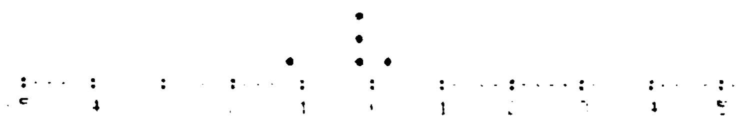
OTHER AEROSPACE

NO. OBS. = 5
MEAN = 30 DAYS
STD. DEV. = 25 DAYS
MIN. OBS. = 2 DAYS
MAX. OBS. = 60 DAYS



OTHER INDUSTRY

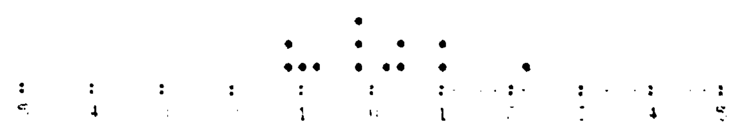
NO. OBS. = 5
MEAN = 18 DAYS
STD. DEV. = 10 DAYS
MIN. OBS. = 2 DAYS
MAX. OBS. = 28 DAYS



OBSERVATIONS

ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = 2 DAYS
MAX. OBS. = 60 DAYS

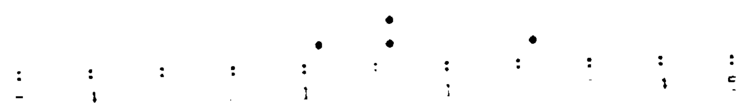


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 24 DAYS STD. DEV. = 17 DAYS

Q17 - LEADTIME TO PREPARE A PROCESS PLAN FOR A NEW CYLINDRICAL PART HAVING 25 OPERATIONS

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 23 days
STD. DEV. = 17 days
MIN. OBS. = 5 days
MAX. OBS. = 45 days

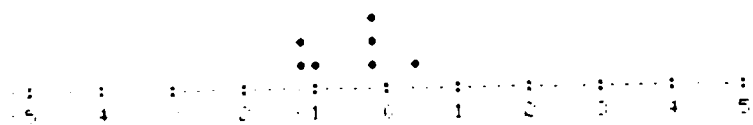


OTHER AEROSPACE

NO. OBS. = 6
MEAN = 20 days
STD. DEV. = 14 days
MIN. OBS. = 1 day
MAX. OBS. = 35 days

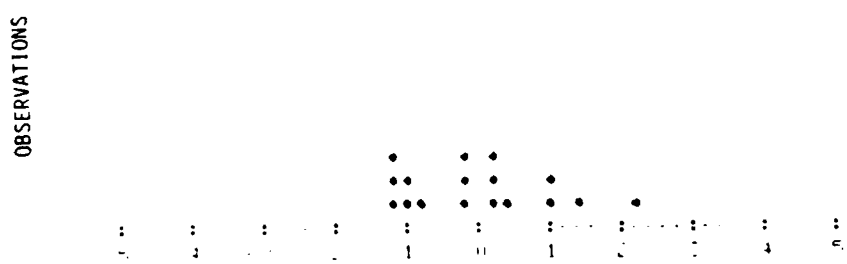
OTHER INDUSTRY

NO. OBS. = 7
MEAN = 10 days
STD. DEV. = 8 days
MIN. OBS. = 2 days
MAX. OBS. = 21 days



ALL RESPONSES

NO. OBS. = 17
MIN. OBS. = 1 day
MAX. OBS. = 45 days



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 17 days STD. DEV. = 13 days

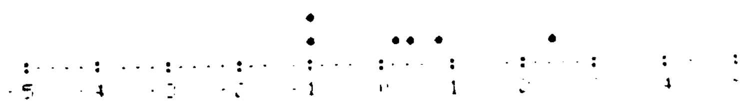
Q17 - LEADTIME TO PREPARE A PROCESS PLAN FOR A NEW CYLINDRICAL PART HAVING 10 OPERATIONS

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 14 DAYS
STD. DEV. = 12 DAYS
MIN. OBS. = 1 DAY
MAX. OBS. = 30 DAYS

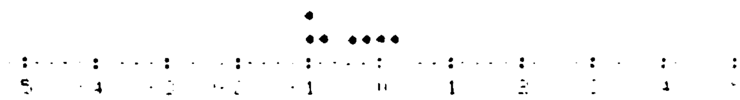
OTHER AEROSPACE

NO. OBS. = 6
MEAN = 14 DAYS
STD. DEV. = 13 DAYS
MIN. OBS. = 0.5 DAYS
MAX. OBS. = 35 DAYS



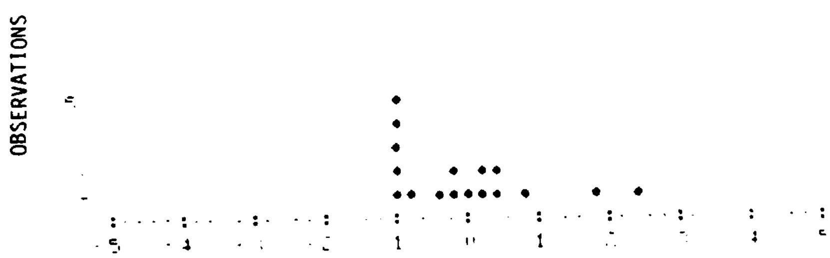
OTHER INDUSTRY

NO. OBS. = 7
MEAN = 7 DAYS
STD. DEV. = 5 DAYS
MIN. OBS. = 2 DAYS
MAX. OBS. = 14 DAYS



ALL RESPONSES

NO. OBS. = 17
MIN. OBS. = 0.5 DAYS
MAX. OBS. = 30 DAYS



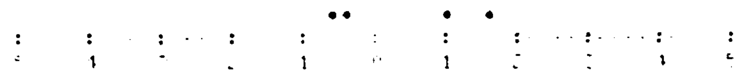
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 11 DAYS   STD. DEV. = 10 DAYS

Q19 - PERCENTAGE OF COSTS ATTRIBUTABLE TO DIRECT LABOR FOR CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

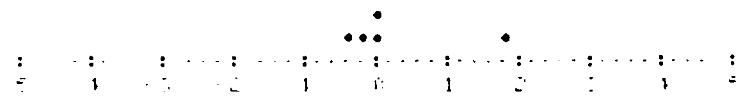
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 36.5%
STD. DEV. = 22.4%
MIN. OBS. = 15.0%
MAX. OBS. = 60.8%



OTHER AEROSPACE

NO. OBS. = 5
MEAN = 33.9%
STD. DEV. = 17.1%
MIN. OBS. = 22.0%
MAX. OBS. = 64.0%

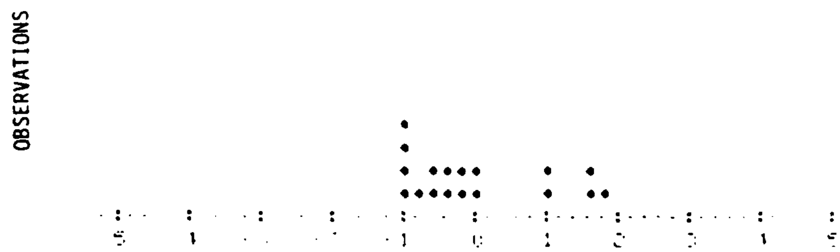


OTHER INDUSTRY

NO. OBS. = 9
MEAN = 22.2%
STD. DEV. = 20.1%
MIN. OBS. = 7.0%
MAX. OBS. = 62.0%

ALL RESPONSES

NO. OBS. = 18
MIN. OBS. = 7%
MAX. OBS. = 64%



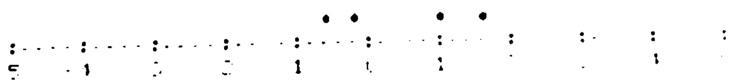
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 28.6%   STD. DEV. = 19.8%

Q19 - PERCENTAGE OF COSTS ATTRIBUTABLE TO DIRECT LABOR FOR NON-CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	38.4%
STD. DEV.	=	20.3%
MIN. OBS.	=	18.0%
MAX. OBS.	=	60.8%

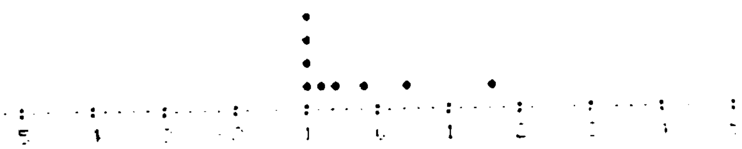


OTHER AEROSPACE

NO. OBS.	=	4
MEAN	=	35.6%
STD. DEV.	=	21.1%
MIN. OBS.	=	22.0%
MAX. OBS.	=	67.0%

OTHER INDUSTRY

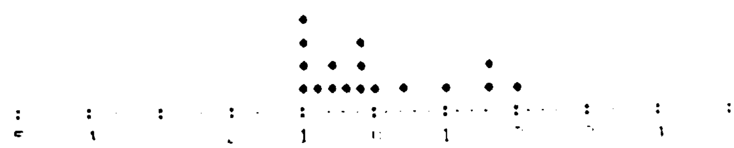
NO. OBS.	=	9
MEAN	=	20.6%
STD. DEV.	=	18.0%
MIN. OBS.	=	7.0%
MAX. OBS.	=	62.0%



ALL RESPONSES

NO. OBS.	=	17
MIN. OBS.	=	7.0%
MAX. OBS.	=	67.0%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 28.3% STD. DEV. = 19.9%

Q19 - PERCENTAGE OF COSTS ATTRIBUTABLE TO TOOLING FOR CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

MISSILE PRIMES & SUBS

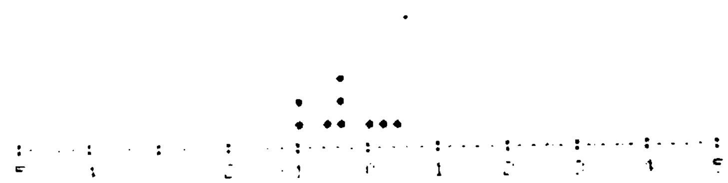
NO. OBS. = 4
MEAN = 10.1
STD. DEV. = 7.0
MIN. OBS. = 5.0
MAX. OBS. = 20.0

OTHER AEROSPACE

NO. OBS. = 5
MEAN = 8.3
STD. DEV. = 10.0
MIN. OBS. = 0.4
MAX. OBS. = 25.0

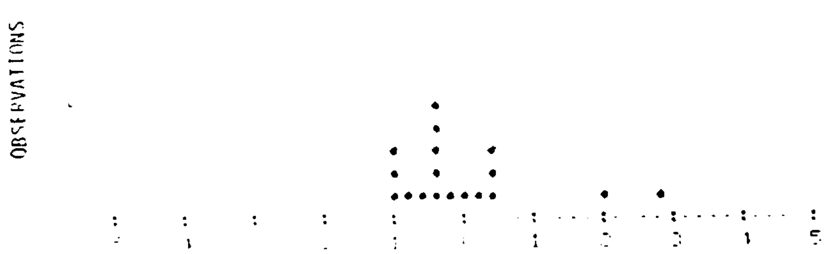
OTHER INDUSTRY

NO. OBS. = 9
MEAN = 5.1
STD. DEV. = 3.3
MIN. OBS. = 0.5
MAX. OBS. = 10.0



ALL RESPONSES

NO. OBS. = 18
MIN. OBS. = 4
MAX. OBS. = 25.0



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 7.1 STD. DEV. = 6.5

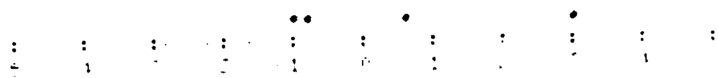
Q19 - PERCENTAGE OF COSTS ATTRIBUTABLE TO TOOLING FOR NON-CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 8.1%
STD. DEV. = 4.7%
MIN. OBS. = 5.0%
MAX. OBS. = 15.0%

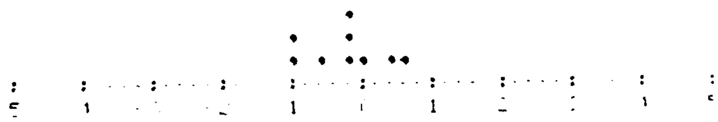
OTHER AEROSPACE

NO. OBS. = 4
MEAN = 9.4%
STD. DEV. = 11.2%
MIN. OBS. = 0.4%
MAX. OBS. = 25.0%



OTHER INDUSTRY

NO. OBS. = 9
MEAN = 5.1%
STD. DEV. = 3.3%
MIN. OBS. = 0.5%
MAX. OBS. = 10.0%



ALL RESPONSES

NO. OBS. = 17
MIN. OBS. = 0.4%
MAX. OBS. = 25%

STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 6.8%   STD DEV. = 6.1%

Q19 - PERCENTAGE OF COSTS ATTRIBUTABLE TO SCRAP AND REWORK FOR CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

MISSILE PRIMES & SUBS

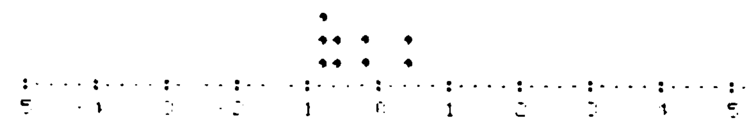
NO. OBS.	=	4
MEAN	=	6.6%
STD. DEV.	=	5.3%
MIN. OBS.	=	2.0%
MAX. OBS.	=	14.3%

OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	3.5%
STD. DEV.	=	2.0%
MIN. OBS.	=	0.9%
MAX. OBS.	=	6.0%

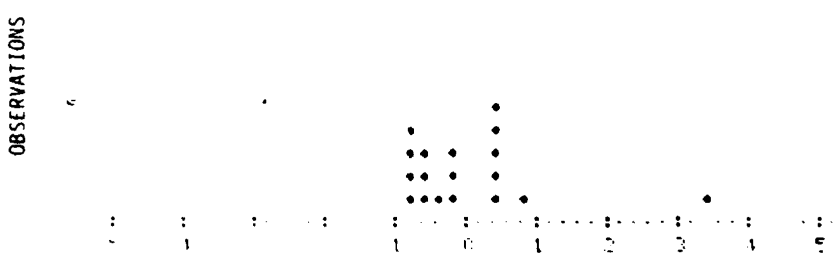
OTHER INDUSTRY

NO. OBS.	=	9
MEAN	=	2.5%
STD. DEV.	=	1.6%
MIN. OBS.	=	1.0%
MAX. OBS.	=	5.0%



ALL RESPONSES

NO. OBS.	=	18
MIN. OBS.	=	0.9%
MAX. OBS.	=	14.3%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 3.7% STD. DEV. = 3.2%

Q19 - PERCENTAGE OF COSTS ATTRIBUTABLE TO SCRAP AND REWORK FOR NON-CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	6.6%
STD. DEV.	=	5.3%
MIN. OBS.	=	2.0%
MAX. OBS.	=	14.3%

OTHER AEROSPACE

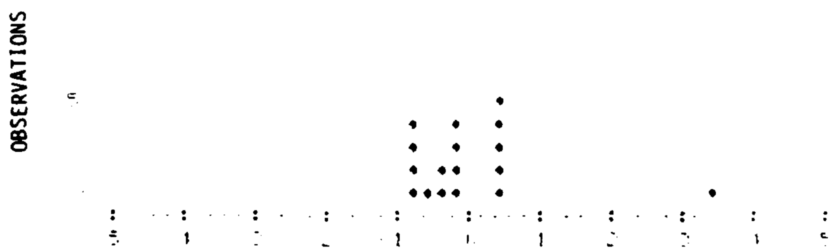
NO. OBS.	=	4
MEAN	=	2.9%
STD. DEV.	=	1.7%
MIN. OBS.	=	0.9%
MAX. OBS.	=	5.0%

OTHER INDUSTRY

NO. OBS.	=	9
MEAN	=	2.5%
STD. DEV.	=	1.6%
MIN. OBS.	=	1.0%
MAX. OBS.	=	5.0%

ALL RESPONSES

NO. OBS.	=	17
MIN. OBS.	=	0.9%
MAX. OBS.	=	14.3%



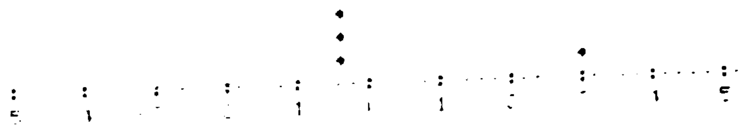
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 3.5% STD. DEV. = 3.2%

Q19 - PERCENTAGE OF COSTS ATTRIBUTABLE TO PROCESS PLANNING FOR CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

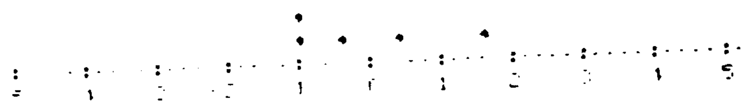
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	11.3%
STD. DEV.	=	12.5%
MIN. OBS.	=	5%
MAX. OBS.	=	30%



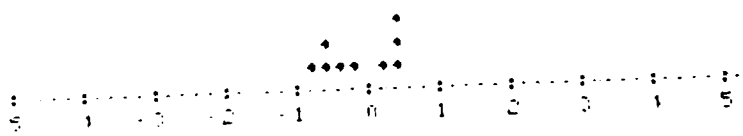
OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	7.2%
STD. DEV.	=	8.2%
MIN. OBS.	=	0.4%
MAX. OBS.	=	20%



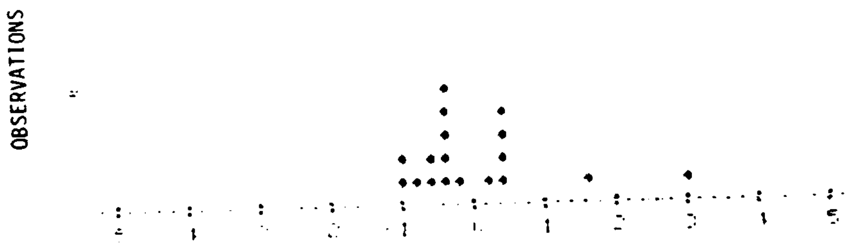
OTHER INDUSTRY

NO. OBS.	=	9
MEAN	=	6.4%
STD. DEV.	=	3.4%
MIN. OBS.	=	3.0%
MAX. OBS.	=	10%



ALL RESPONSES

NO. OBS.	=	18
MIN. OBS.	=	7.7%
MAX. OBS.	=	9.0%



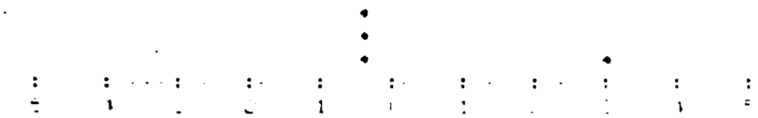
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 7.7% STD. DEV. = 7.2%

Q19 - PERCENTAGE OF COSTS ATTRIBUTABLE TO PROCESS PLANNING FOR NON-CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

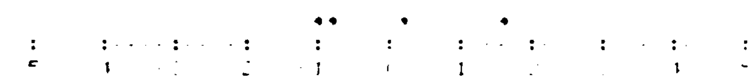
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	11.3%
STD. DEV.	=	12.5%
MIN. OBS.	=	5.0%
MAX. OBS.	=	30.0%



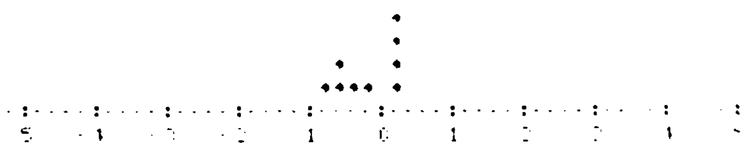
OTHER AEROSPACE

NO. OBS.	=	4
MEAN	=	8.0%
STD. DEV.	=	9.1%
MIN. OBS.	=	0.4%
MAX. OBS.	=	20.0%



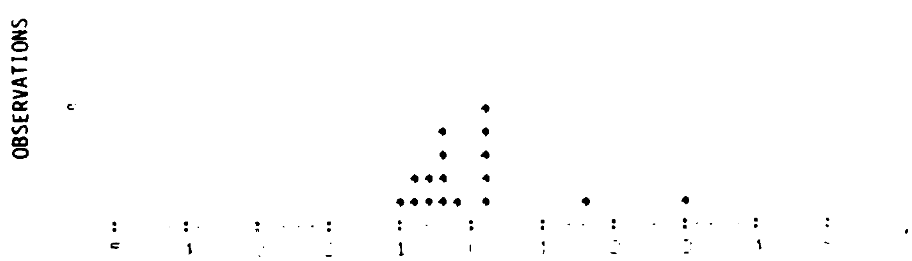
OTHER INDUSTRY

NO. OBS.	=	9
MEAN	=	6.4%
STD. DEV.	=	3.4%
MIN. OBS.	=	2.0%
MAX. OBS.	=	10.0%



ALL RESPONSES

NO. OBS.	=	17
MIN. OBS.	=	0.4%
MAX. OBS.	=	30%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 8.0%   STD. DEV. = 7.4%

Q19 - PERCENTAGE OF COSTS ATTRIBUTABLE TO OVERHEAD, PROFIT, ETC., FOR CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	23.8
STD. DEV.	=	20.6
MIN. OBS.	=	0
MAX. OBS.	=	50

OTHER AEROSPACE

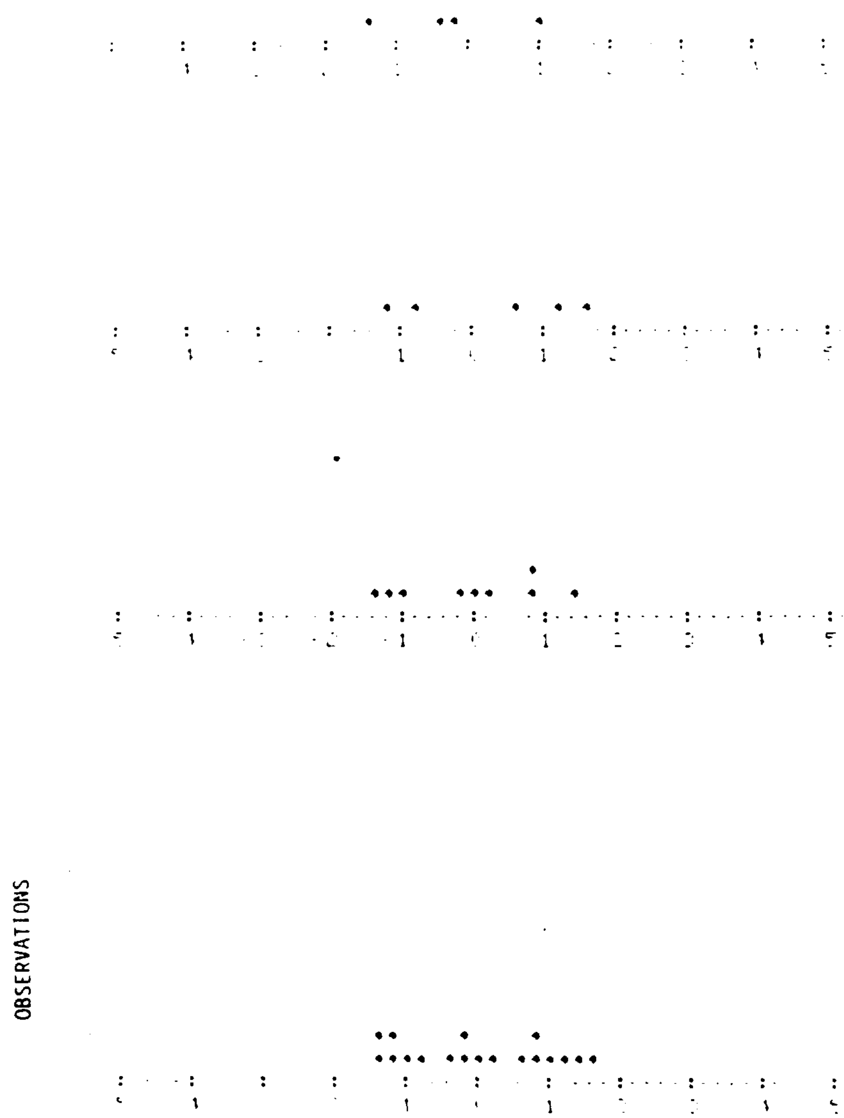
NO. OBS.	=	5
MEAN	=	36.8
STD. DEV.	=	27.0
MIN. OBS.	=	5
MAX. OBS.	=	64.9

OTHER INDUSTRY

NO. OBS.	=	9
MEAN	=	28.6
STD. DEV.	=	21.1
MIN. OBS.	=	0
MAX. OBS.	=	59

ALL RESPONSES

NO. OBS.	=	18
MIN. OBS.	=	0%
MAX. OBS.	=	64.9



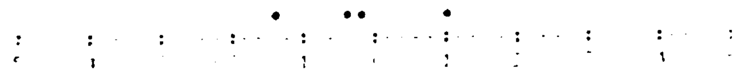
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 29.8 STD. DEV. = 21.9

Q19 - PERCENTAGE OF COSTS ATTRIBUTABLE TO OVERHEAD, PROFIT, ETC., FOR NON-CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

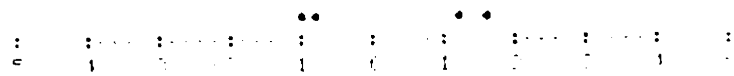
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 23.8%
STD. DEV. = 20.6%
MIN. OBS. = 0%
MAX. OBS. = 50%



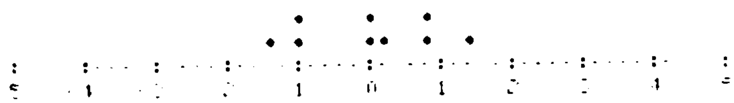
OTHER AEROSPACE

NO OBS. = 4
MEAN = 34.5%
STD. DEV. = 30.3%
MIN. OBS. = 5%
MAX. OBS. = 63%



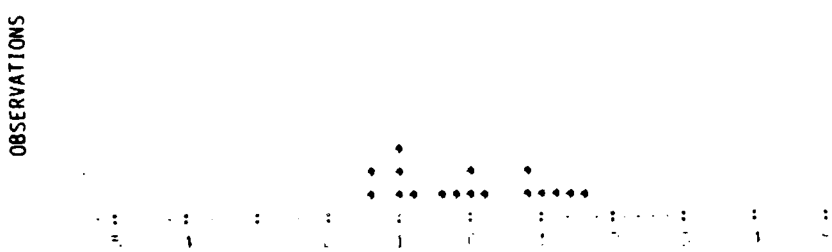
OTHER INDUSTRY

NO. OBS. = 9
MEAN = 28.6%
STD. DEV. = 21.1%
MIN. OBS. = 0%
MAX. OBS. = 59%



ALL RESPONSES

NO. OBS. = 17
MIN. OBS. = 0
MAX. OBS. = 63%

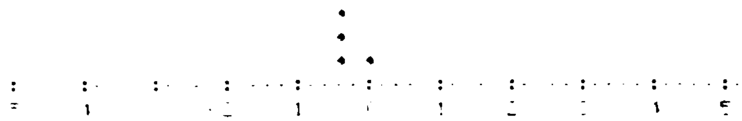


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 28.9%   STD. DEV. = 22.1%

Q20 - APPROXIMATE ANNUAL VALUE OF WORK IN PROCESS INVENTORY FOR CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = $ 5.9 MIL.
STD. DEV. = $ 9.4 MIL.
MIN. OBS. = $ 0.7 MIL.
MAX. OBS. = $ 20 MIL.

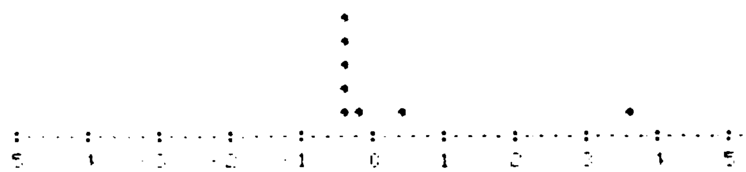


OTHER AEROSPACE

NO. OBS. = 3
MEAN = $10.1 MIL.
STD. DEV. = $ 7.7 MIL.
MIN. OBS. = $ 1.3 MIL.
MAX. OBS. = $15.0 MIL.

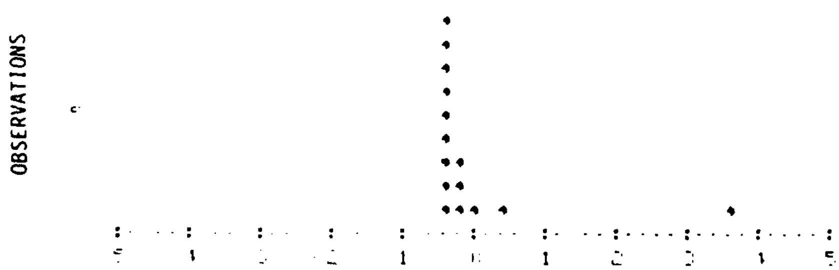
OTHER INDUSTRY

NO. OBS. = 8
MEAN = $35.5 MIL.
STD. DEV. = $78.9 MIL.
MIN. OBS. = $ 0.1 MIL.
MAX. OBS. = $226 MIL.



ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = $0.1 MIL.
MAX. OBS. = $226 MIL

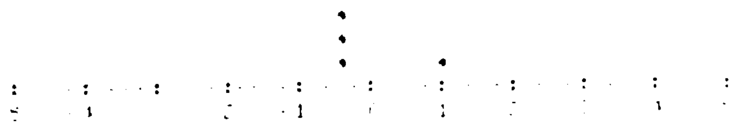


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $22.5 MIL. STD. DEV. = $57.8 MIL.

Q20 - APPROXIMATE ANNUAL VALUE OF WORK IN PROCESS INVENTORY FOR NON-CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = $13.9 MIL.
STD. DEV. = $ 24.1 MIL.
MIN. OBS. = $ 0.6 MIL.
MAX. OBS. = $ 50.0 MIL.

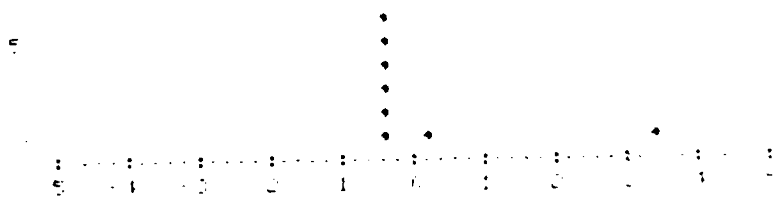


OTHER AEROSPACE

NO. OBS. = 3
MEAN = $6.0 MIL.
STD. DEV. = $3.6 MIL.
MIN. OBS. = $3.0 MIL.
MAX. OBS. = $10.0 MIL.

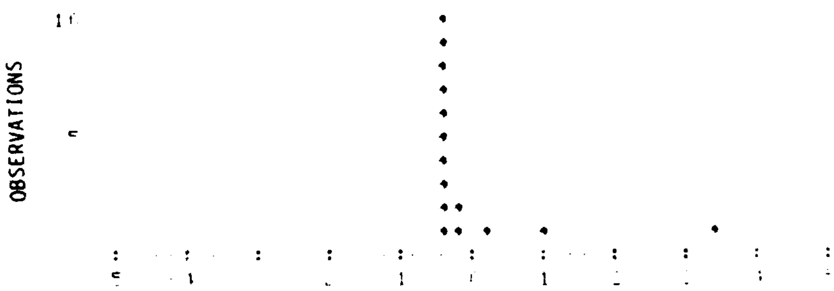
OTHER INDUSTRY

NO. OBS. = 8
MEAN = $19.5 MIL.
STD. DEV. = $46.4 MIL.
MIN. OBS. = $ 0.1 MIL.
MAX. OBS. = $133 MIL.



ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = $ 0.1 MIL.
MAX. OBS. = $ 133 MIL.



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $15.3 MIL. STD. DEV. =$ 35.1 MIL

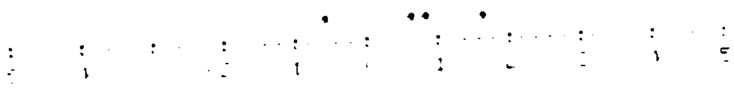
RESPONSES TO QUESTIONS 21 AND 22

	MISSILE PRIME AND SUBS.		OTHER AEROSPACE		OTHER INDUSTRY		TOTAL	
	YES	NO	YES	NO	YES	NO	YES	NO
Q21 - DOES YOUR PLANT USE COMPUTER ASSISTED PROCESS PLANNING AND/OR GROUP TECHNOLOGY FOR AREAS OTHER THAN MACHINED PARTS?	1	3	6	1	3	6	10	10
Q22 - HAS YOUR COMPANY PERFORMED STUDIES RELATING TO PROCESS PLANNING ECONOMICS OR THE COSTS OF MANUFACTURING MACHINED PARTS?	2	2	7	0	4	5	13	7

Q23 - PERCENT CHANGE IN PROCESS PLANNING COSTS FOR CYLINDRICAL PARTS -- SYSTEM I

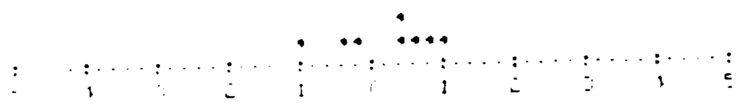
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -13.6%
STD. DEV. = 20.6%
MIN. OBS. = - 40%
MAX. OBS. = 10%



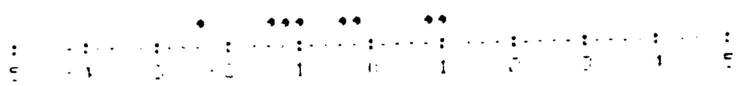
OTHER AEROSPACE

NO. OBS. = 8
MEAN = -22.6%
STD. DEV. = 14.5%
MIN. OBS. = - 49%
MAX. OBS. = - 5%



OTHER INDUSTRY

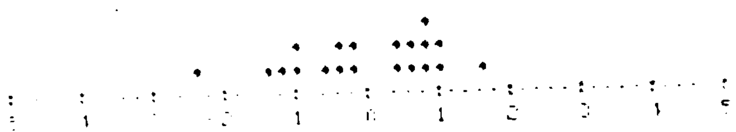
NO. OBS. = 8
MEAN = -39.7%
STD. DEV = 26.1%
MIN. OBS. = - 80%
MAX. OBS. = - 3%



ALL RESPONSES

NO. OBS. = 20
MIN. OBS. = - 80%
MAX. OBS. = 10%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -27.7% STD. DEV. = 22.5%

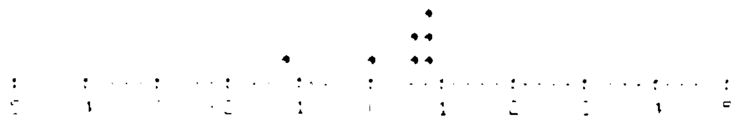
23 - PERCENT CHANGE IN PREPARING DOCUMENTATION FOR CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -8.8%
STD. DEV. = 13.1%
MIN. OBS. = - 20%
MAX. OBS. = 10%

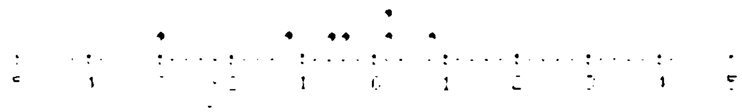
OTHER AEROSPACE

NO. OBS. = 7
MEAN = -9.0%
STD. DEV. = 14.7%
MIN. OBS. = - 40%
MAX. OBS. = 0%



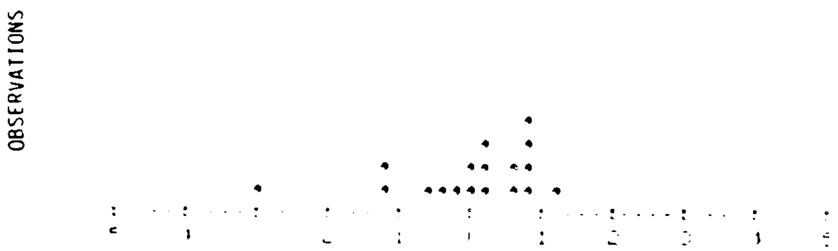
OTHER INDUSTRY

NO. OBS. = 7
MEAN = -27.1%
STD. DEV. = 25.1%
MIN. OBS. = - 75%
MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 18
MIN. OBS. = 75%
MAX. OBS. = 10%

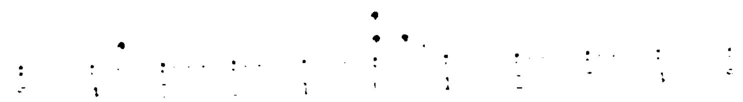


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN =-16 STD. DEV. = 20.3%

Q23 - PERCENT CHANGE IN PERFORMING TOLERANCE ANALYSES FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

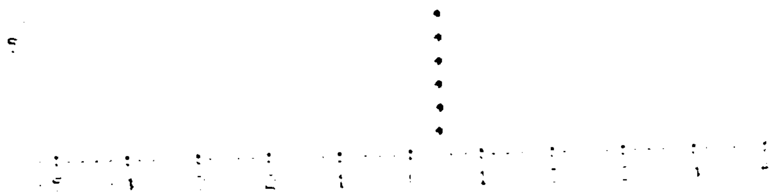
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -23.8%
STD. DEV. = 34.5%
MIN. OBS. = - 75%
MAX. OBS. = 0%



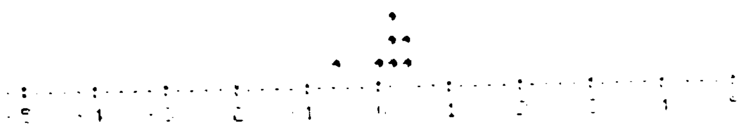
OTHER AEROSPACE

NO. OBS. = 6
MEAN = -8.3%
STD. DEV. = 0.2%
MIN. OBS. = -0.5%
MAX. OBS. = 0%



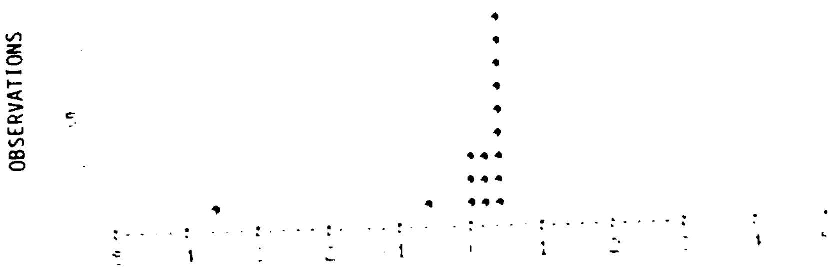
OTHER INDUSTRY

NO. OBS. = 7
MEAN = -6.6%
STD. DEV. = 6.8%
MIN. OBS. = - 20%
MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 17
MIN. OBS. = - 75%
MAX. OBS. = 0%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = - 8.3%   STD. DEV. = 18.1%

Q23 - PERCENT CHANGE IN PERFORMING TOLERANCE ANALYSES FOR CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	-23.8%
STD. DEV.	=	34.5%
MIN. OBS.	=	- 75%
MAX. OBS.	=	0%

OTHER AEROSPACE

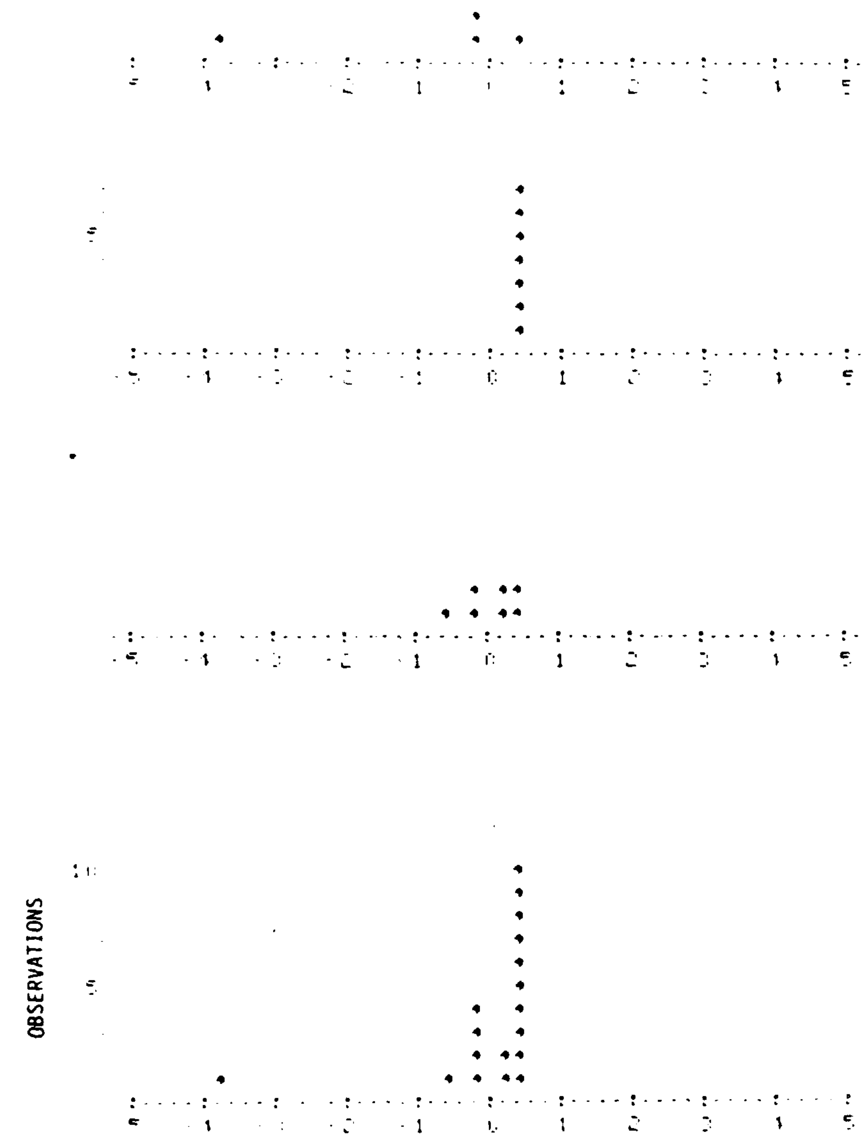
NO. OBS.	=	7
MEAN	=	-0.1%
STD. DEV.	=	0.2%
MIN. OBS.	=	-0.5%
MAX. OBS.	=	0%

OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	-7.3%
STD. DEV.	=	6.8%
MIN. OBS.	=	- 20%
MAX. OBS.	=	0%

ALL RESPONSES

NO. OBS.	=	18
MIN. OBS.	=	- 75%
MAX. OBS.	=	0%



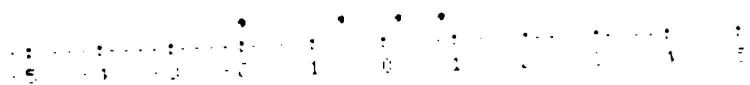
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -8.1%   STD. DEV. = 17.6%

Q23 - PERCENT CHANGE IN GENERATING TIME STANDARDS FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -21.3%
STD. DEV. = 21.7%
MIN. OBS. = - 50 %
MAX. OBS. = 0 %

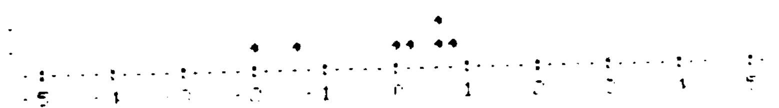


OTHER AEROSPACE

NO. OBS. = 6
MEAN = -7.5%
STD. DEV. = 11.6%
MIN. OBS. = - 30%
MAX. OBS. = 0%

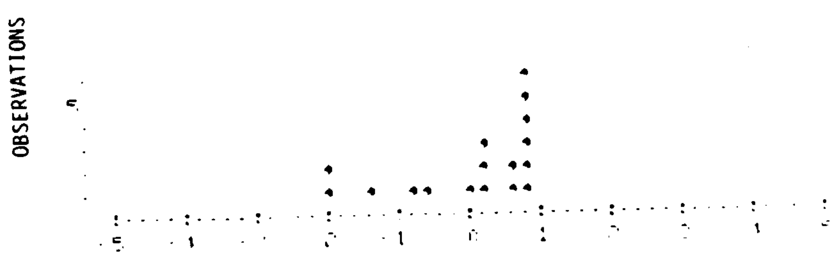
OTHER INDUSTRY

NO. OBS. = 7
MEAN = -17.9%
STD. DEV. = 19.3%
MIN. OBS. = - 50 %
MAX. OBS. = 0 %



ALL RESPONSES

NO. OBS. = 17
MIN. OBS. = - 50%
MAX. OBS. = 0%



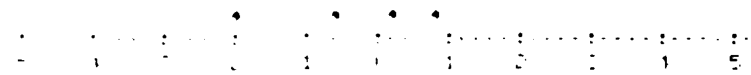
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = - 15.0% STD. DEV. = 19.3%

Q23 - PERCENT CHANGE IN GENERATING TIME STANDARDS FOR CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -21.3%
STD. DEV. = 21.7%
MIN. OBS. = - 50 %
MAX. OBS. = 0 %

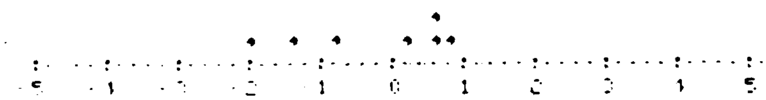


OTHER AEROSPACE

NO. OBS. = 7
MEAN = -6.4%
STD. DEV. = 11.0%
MIN. OBS. = - 30%
MAX. OBS. = 0%

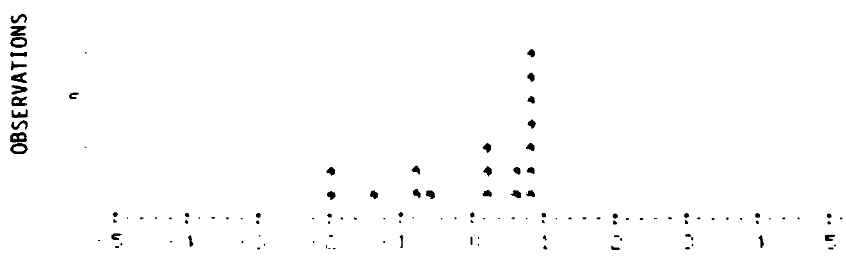
OTHER INDUSTRY

NO. OBS. = 7
MEAN = -20.0%
STD. DEV. = 19.8%
MIN. OBS. = - 50%
MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 18
MIN. OBS. = - 50%
MAX. OBS. = 0%

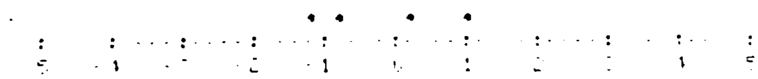


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = - 15.0% STD. DEV. =17.7%

Q23 - PERCENT CHANGE IN DETERMINING PROCESS PARAMETERS FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

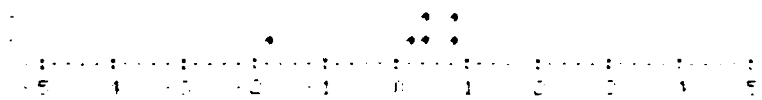
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -16.3%
STD. DEV. = 13.8%
MIN. OBS. = - 30%
MAX. OBS. = 0%



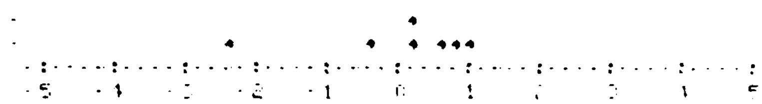
OTHER AEROSPACE

NO. OBS. = 6
MEAN = - 11.7%
STD. DEV. = 14.3%
MIN. OBS. = - 40%
MAX. OBS. = - 1%



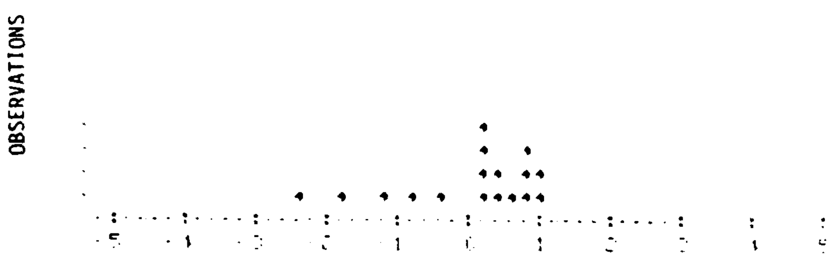
OTHER INDUSTRY

NO. OBS. = 7
MEAN = -13.9%
STD. DEV. = 17.2%
MIN. OBS. = - 50%
MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 17
MIN. OBS. = - 50%
MAX. OBS. = 0%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = -13.6% STD. DEV. = 14.6%

Q23 - PERCENT CHANGE IN DETERMINING PROCESS PARAMETERS FOR CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -16.3%
STD. DEV. = 13.8%
MIN. OBS. = -30 %
MAX. OBS. = 0%

OTHER AEROSPACE

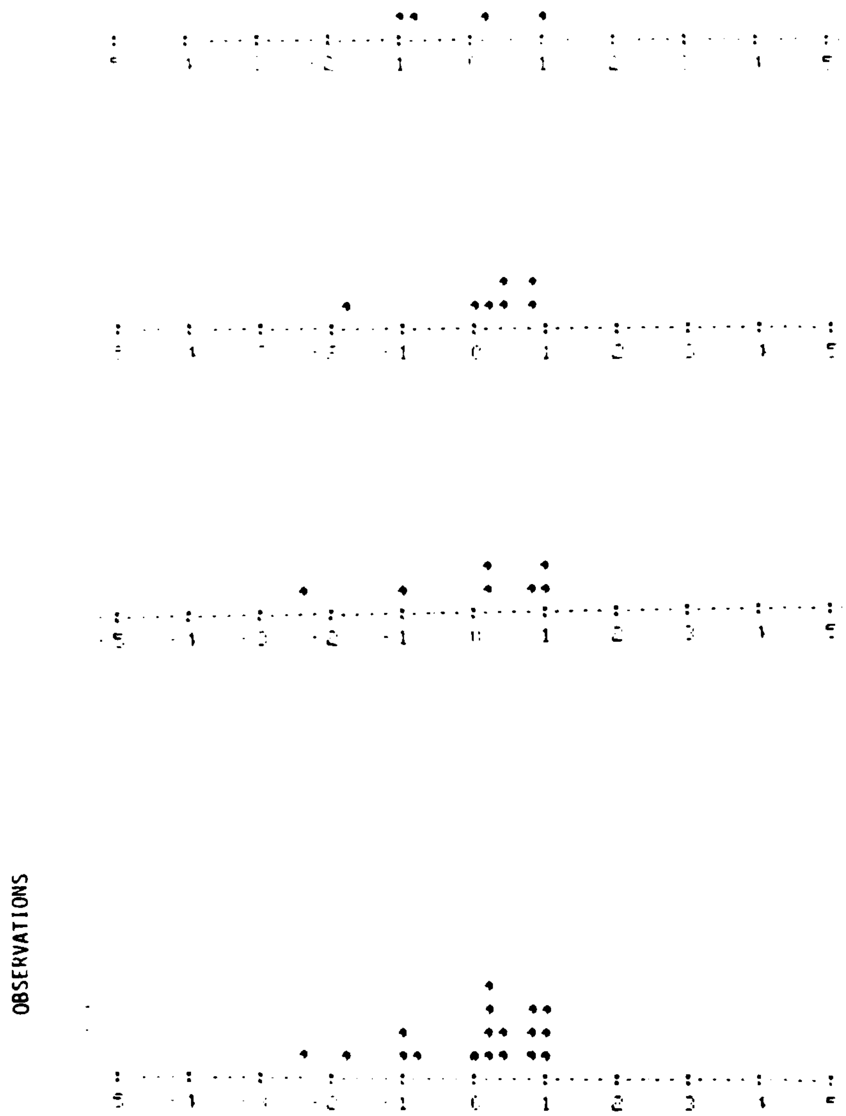
NO. OBS. = 7
MEAN = -12.4%
STD. DEV. = 12.8%
MIN. OBS. = - 40%
MAX. OBS. = - 3%

OTHER INDUSTRY

NO. OBS. = 7
MEAN = -14.6%
STD. DEV. = 18.0%
MIN. OBS. = - 50%
MAX. OBS. = 0%

ALL RESPONSES

NO. OBS. = 18
MIN. OBS. = - 50%
MAX. OBS. = 0%

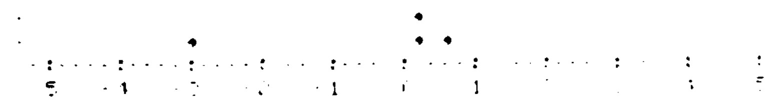


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = -14.1%   STD. DEV. = 14.8%

Q23 - PERCENT CHANGE IN SELECTING TOOLS FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

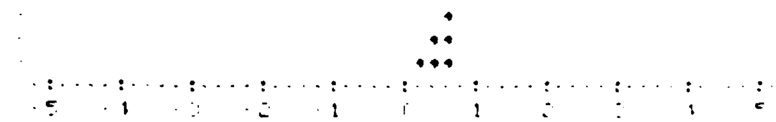
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -23.8%
STD. DEV. = 34.5%
MIN. OBS. = - 75%
MAX. OBS. = 0%



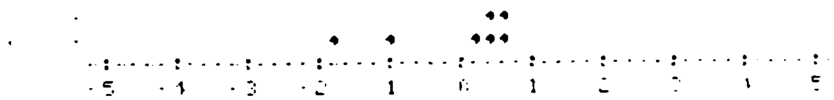
OTHER AEROSPACE

NO. OBS. = 6
MEAN = -3.7%
STD. DEV. = 3.5%
MIN. OBS. = - 10%
MAX. OBS. = 0%



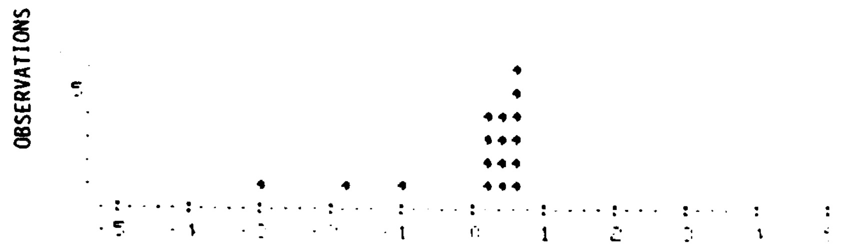
OTHER INDUSTRY

NO. OBS. = 7
MEAN = -15.4%
STD. DEV. = 19.2%
MIN. OBS. = - .50%
MAX. OBS. = - 1%



ALL RESPONSES

NO. OBS. = 17
MIN. OBS. = - 75%
MAX. OBS. = 0%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = -13.2% STD. DEV. = 20.7%

Q22 - PERCENT CHANGE IN SELECTING TOOLS FOR CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -23.8%
STD. DEV. = 34.5%
MIN. OBS. = - 75%
MAX OBS. = 0

OTHER AEROSPACE

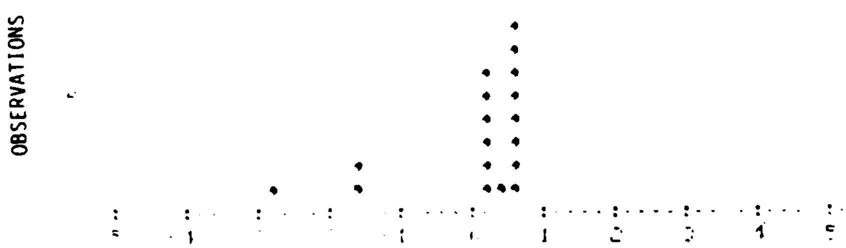
NO. OBS. = 7
MEAN = -4.0
STD. DEV. = 4.2%
MIN. OBS. = - 10
MAX. OBS. = 0%

OTHER INDUSTRY

NO. OBS. = 7
MEAN = -18.3%
STD. DEV. = 21.9%
MIN. OBS. = - 50%
MAX. OBS. = - 1%

ALL RESPONSES

NO. OBS. = 18
MIN. OBS. = - 75%
MAX. OBS. = 0%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -13.9%   STD. DEV. = 21.4%

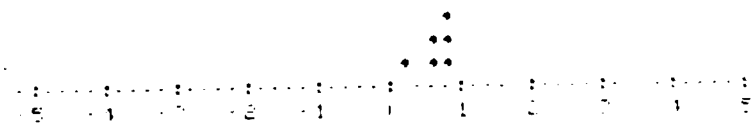
Q23 - PERCENT CHANGE IN SELECTING MACHINES FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	-21.3%
STD. DEV.	=	21.7%
MIN. OBS.	=	- 50%
MAX. OBS.	=	0%

OTHER AEROSPACE

NO. OBS.	=	6
MEAN	=	-3.5%
STD. DEV.	=	3.6%
MIN. OBS.	=	- 10%
MAX. OBS.	=	0%

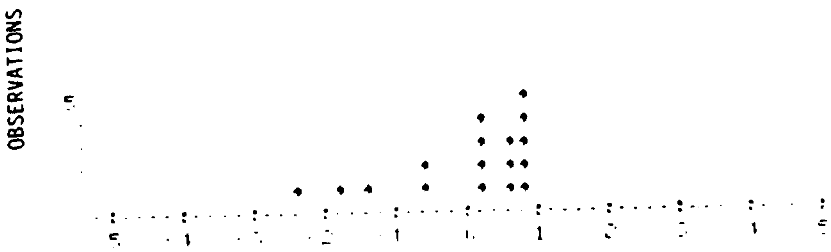


OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	-21.4%
STD. DEV.	=	21.7%
MIN. OBS.	=	- 60%
MAX. OBS.	=	0%

ALL RESPONSES

NO. OBS.	=	17
MIN. OBS.	=	- 60%
MAX. OBS.	=	0%



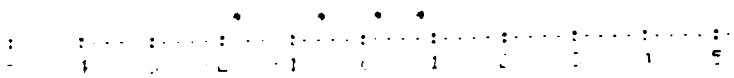
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -15.1% STD. DEV. = 18.6%

Q23 - PERCENT CHANGE IN SELECTING MACHINES FOR CYLINDRICAL PARTS -- SYSTEM 1

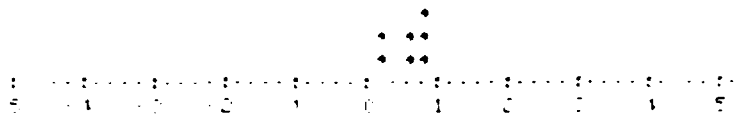
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -26.3%
STD. DEV. = 21.7%
MIN. OBS. = - 50%
MAX. OBS. = 0%



OTHER AEROSPACE

NO. OBS. = 7
MEAN = -4.7%
STD. DEV. = 3.8%
MIN. OBS. = - 10%
MAX. OBS. = - 1%

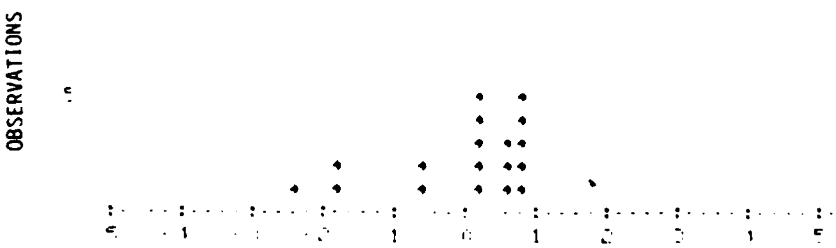


OTHER INDUSTRY

NO. OBS. = 7
MEAN = -22.9%
STD. DEV. = 23.4%
MIN. OBS. = - 60%
MAX. OBS. = 0%

ALL RESPONSES

NO. OBS. = 18
MIN. OBS. = - 60%
MAX. OBS. = 0%



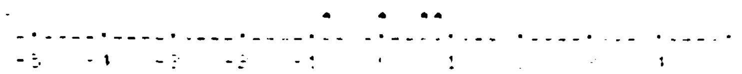
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -15.4% STD. DEV. = 19.0%

Q23 - PERCENT CHANGE IN DETERMINING OPERATION SEQUENCE FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

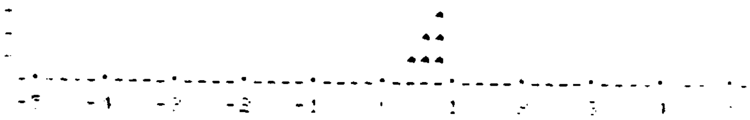
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	-21.3%
STD. DEV.	=	21.7%
MIN. OBS.	=	- 50%
MAX. OBS.	=	0%



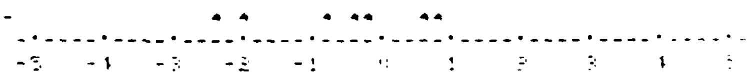
OTHER AEROSPACE

NO. OBS.	=	6
MEAN	=	-6.7%
STD. DEV.	=	5.9%
MIN. OBS.	=	- 15%
MAX. OBS.	=	0%



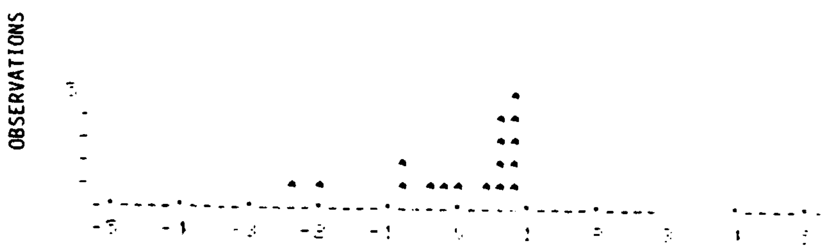
OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	-43.1%
STD. DEV.	=	34.5%
MIN. OBS.	=	- 95%
MAX. OBS.	=	- 2%



ALL RESPONSES

NO. OBS.	=	17
MIN. OBS.	=	- 95%
MAX. OBS.	=	0%



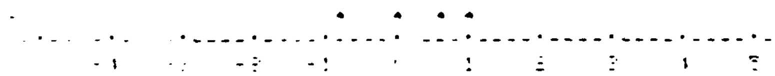
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -25.1% STD. DEV. = 28.6%

Q23 - PERCENT CHANGE IN DETERMINING OPERATION SEQUENCE FOR CYLINDRICAL PARTS -- SYSTEM 1

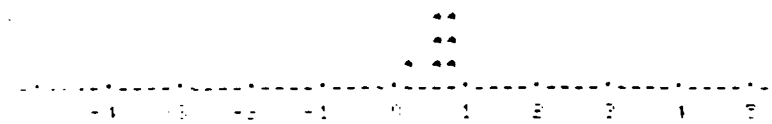
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -21.3
STD. DEV. = 21.7%
MIN. OBS. = - 50%
MAX. OBS. = 0%



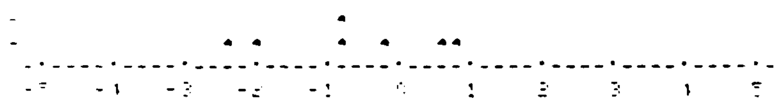
OTHER AEROSPACE

NO. OBS. = 7
MEAN = -8.6%
STD. DEV. = 6.1%
MIN. OBS. = - 20%
MAX. OBS. = - 2%



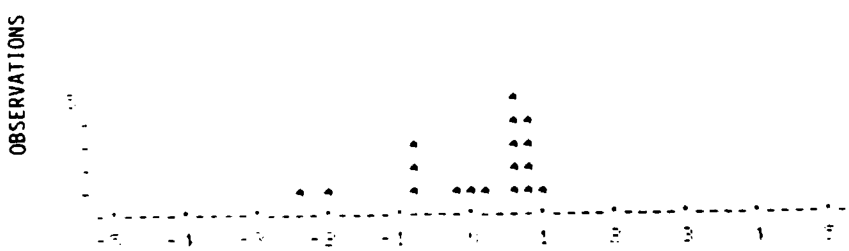
OTHER INDUSTRY

NO. OBS. = 7
MEAN = -45.2%
STD. DEV. = 34.3%
MIN. OBS. = - 95%
MAX. OBS. = - 2%



ALL RESPONSES

NO. OBS. = 18
MIN. OBS. = - 95%
MAX. OBS. = 0%



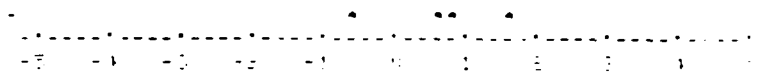
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -25.7% STD. DEV. = 28.2%

Q23 - PERCENT CHANGE IN PROCESS PLANNING COSTS FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

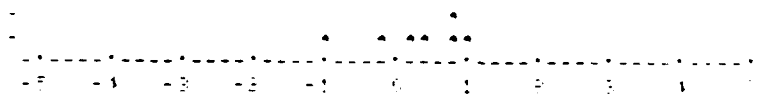
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -13.6%
STD. DEV. = 20.6%
MIN. OBS. = - 40%
MAX. OBS. = 10%



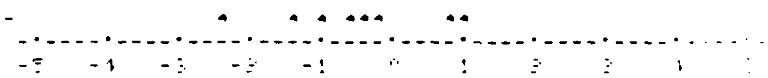
OTHER AEROSPACE

NO. OBS. = 7
MEAN = -19.7%
STD. DEV. = 15.3%
MIN. OBS. = - 30%
MAX. OBS. = - 5%



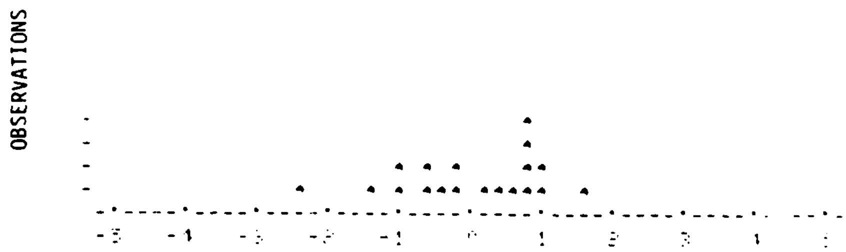
OTHER INDUSTRY

NO. OBS. = 8
MEAN = -37.8%
STD. DEV. = 25.4%
MIN. OBS. = - 80%
MAX. OBS. = - 3%



ALL RESPONSES

NO. OBS. = 19
MIN. OBS. = - 80%
MAX. OBS. = 10%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = -37.8% STD. DEV. = 25.4%

Q23 - PERCENT CHANGE IN PREPARING DOCUMENTATION FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

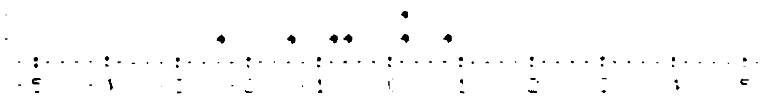
NO. OBS.	=	4
MEAN	=	-8.8%
STD. DEV.	=	13.1%
MIN. OBS.	=	- 20%
MAX. OBS.	=	10%

OTHER AEROSPACE

NO. OBS.	=	6
MEAN	=	-7.4%
STD. DEV.	=	16.0%
MIN. OBS.	=	- 40%
MAX. OBS.	=	0%

OTHER INDUSTRY

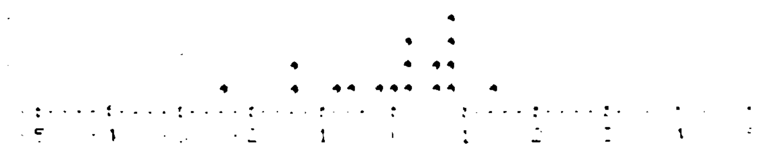
NO. OBS.	=	7
MEAN	=	- 25%
STD. DEV.	=	20.6%
MIN. OBS.	=	- 60%
MAX. OBS.	=	0%



ALL RESPONSES

NO. OBS.	=	17
MIN. OBS.	=	- 60%
MAX. OBS.	=	10%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = - 15.0% STD. DEV. = 18.6%

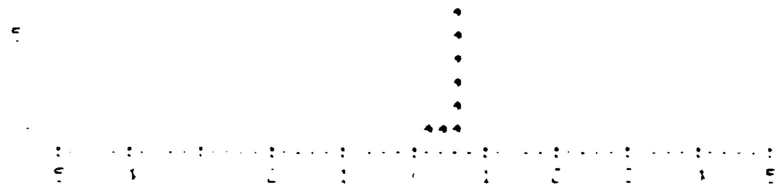
Q23 - PERCENT CHANGE IN MATERIAL FOR CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	-2.5
STD. DEV.	=	2.1%
MIN. OBS.	=	- 5%
MAX. OBS.	=	0%

OTHER AEROSPACE

NO. OBS.	=	8
MEAN	=	-0.3
STD. DEV.	=	0.7%
MIN. OBS.	=	- 2%
MAX. OBS.	=	0%

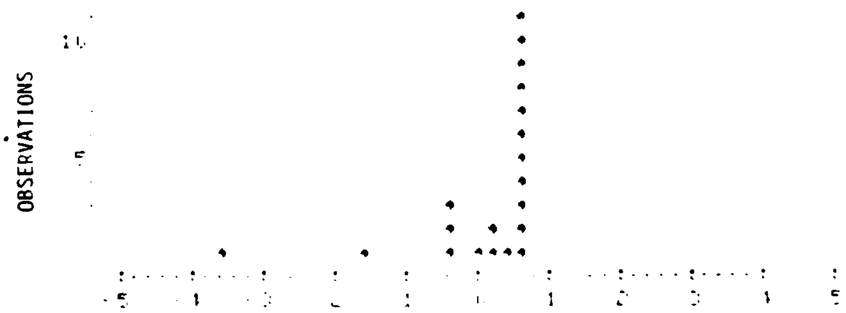


OTHER INDUSTRY

NO. OBS.	=	8
MEAN	=	- 5%
STD. DEV.	=	7.1%
MIN. OBS.	=	- 20%
MAX. OBS.	=	0%

ALL RESPONSES

NO. OBS.	=	20
MIN. OBS.	=	- 20%
MAX. OBS.	=	0%



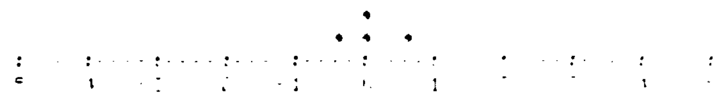
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = - 2.6%   STD. DEV. = 4.9%

Q23 - PERCENT CHANGE IN MATERIAL FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

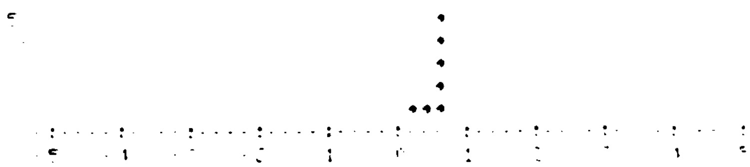
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	-2.8%
STD. DEV.	=	2.0%
MIN. OBS.	=	-5.0%
MAX. OBS.	=	0%



OTHER AEROSPACE

NO. OBS.	=	7
MEAN	=	-0.4%
STD. DEV.	=	0.7%
MIN. OBS.	=	-2.0%
MAX. OBS.	=	0%

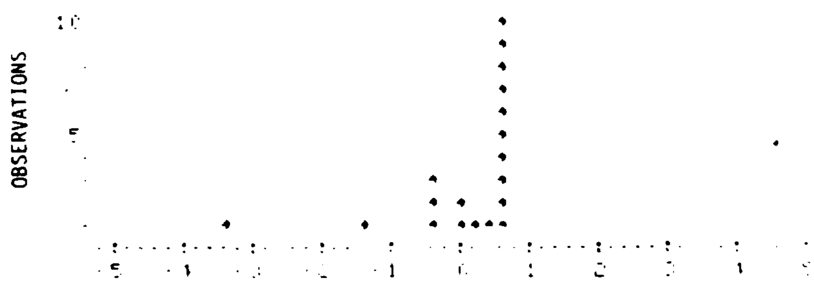


OTHER INDUSTRY

NO. OBS.	=	8
MEAN	=	- 5%
STD. DEV.	=	7.1%
MIN. OBS.	=	- 20%
MAX. OBS.	=	0%

ALL RESPONSES

NO. OBS.	=	19
MIN. OBS.	=	- 20%
MAX. OBS.	=	0%



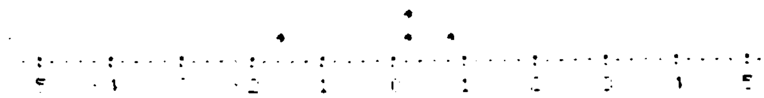
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = - 2.8% STD. DEV. = 5.0%

Q23 - PERCENT CHANGE IN DIRECT LABOR FOR CYLINDRICAL PARTS -- SYSTEM 1

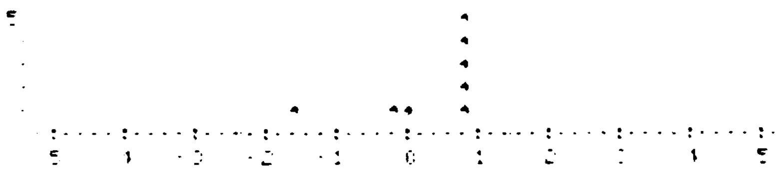
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -5.2%
STD. DEV. = 6.7%
MIN. OBS. = - 15%
MAX. OBS. = 0%



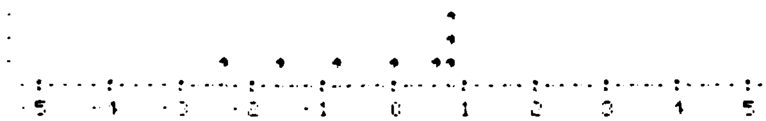
OTHER AEROSPACE

NO. OBS. = 8
MEAN = -3.3%
STD. DEV. = 5.4%
MIN. OBS. = - 15%
MAX. OBS. = 0%



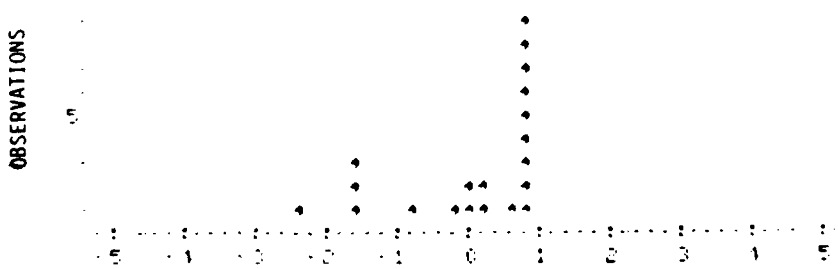
OTHER INDUSTRY

NO. OBS. = 8
MEAN = -6.4%
STD. DEV. = 7.8%
MIN. OBS. = - 20%
MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 20
MIN. OBS. = - 20%
MAX. OBS. = 0%



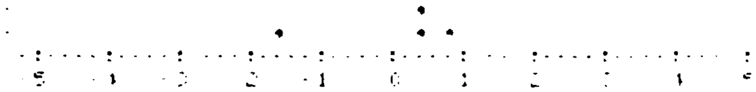
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = - 49% STD. DEV. = 6.5%

Q23 - PERCENT CHANGE IN DIRECT LABOR FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

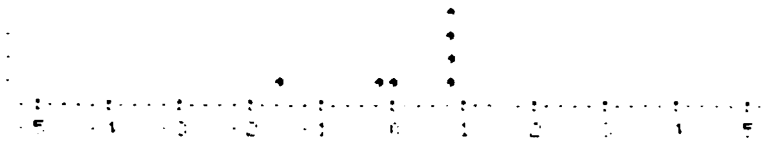
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	-5.3%
STD. DEV.	=	6.7%
MIN. OBS.	=	- 15%
MAX. OBS.	=	0%



OTHER AEROSPACE

NO. OBS.	=	7
MEAN	=	-3.7%
STD. DEV.	=	5.6%
MIN. OBS.	=	- 15%
MAX. OBS.	=	0%

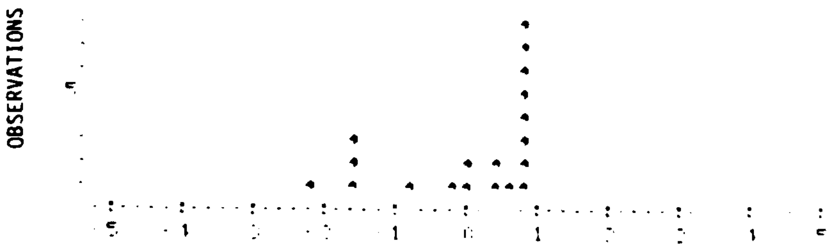


OTHER INDUSTRY

NO. OBS.	=	8
MEAN	=	-6.4%
STD. DEV.	=	7.8%
MIN. OBS.	=	- 20%
MAX. OBS.	=	0 %

ALL RESPONSES

NO. OBS.	=	19
MIN. OBS.	=	- 20%
MAX. OBS.	=	0%



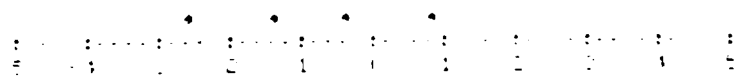
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -5.2% STD. DEV. = 6.6%

Q23 - PERCENT CHANGE IN SCRAP AND REWORK FOR CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -7.5%
STD. DEV. = 6.5%
MIN. OBS. = - 15%
MAX. OBS. = 0%

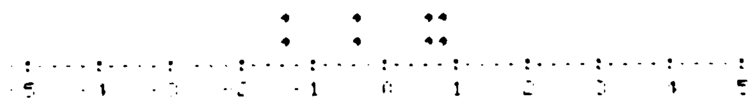


OTHER AEROSPACE

NO. OBS. = 8
MEAN = -1.4%
STD. DEV. = 1.8%
MIN. OBS. = - 5%
MAX. OBS. = 0%

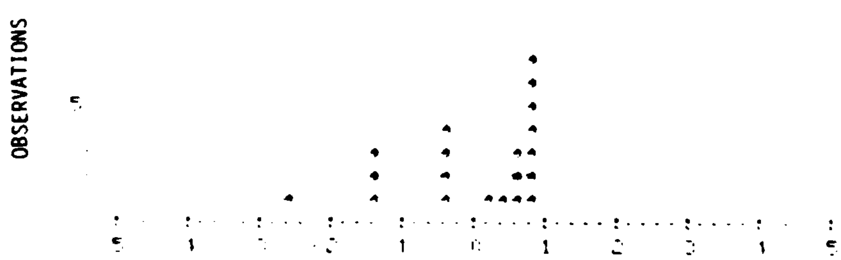
OTHER INDUSTRY

NO. OBS. = 8
MEAN = - 4%
STD. DEV. = 4.2%
MIN. OBS. = - 10%
MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 20
MIN. OBS. = - 15%
MAX. OBS. = 0%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -3.7% STD. DEV. = 4.4%

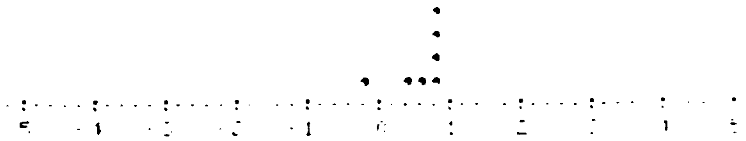
Q23 - PERCENT CHANGE IN SCRAP AND REWORK FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -7.5%
STD. DEV. = 6.5%
MIN. OBS. = -15%
MAX. OBS. = 0%

OTHER AEROSPACE

NO. OBS. = 7
MEAN = -1.1%
STD. DEV. = 1.9%
MIN. OBS. = -5.0%
MAX. OBS. = 0%



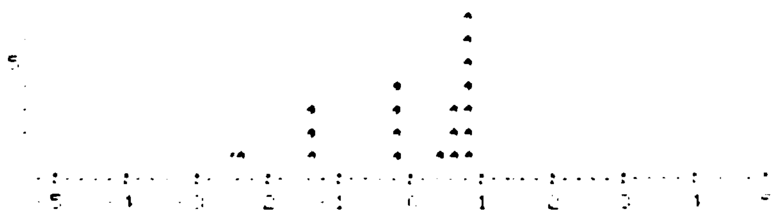
OTHER INDUSTRY

NO. OBS. = 8
MEAN = - 4%
STD. DEV. = 4.2%
MIN. OBS. = - 10%
MAX. OBS. = 0%

ALL RESPONSES

NO. OBS. = 19
MIN. OBS. = - 15%
MAX. OBS. = 0%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = -3.7% STD. DEV. = 4.6%

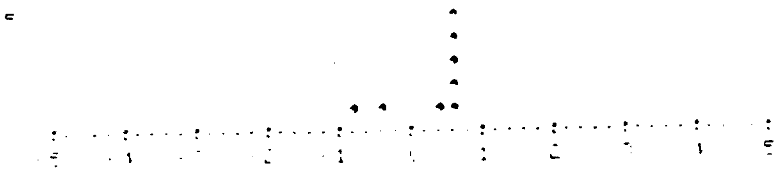
Q23 - PERCENT CHANGE IN TOOLING FOR CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -0.7
STD. DEV. = 9.1
MIN. OBS. = -20
MAX. OBS. = 0

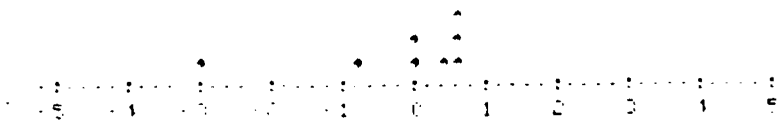
OTHER AEROSPACE

NO. OBS. = 8
MEAN = -2.5
STD. DEV. = 3.9
MIN. OBS. = -10
MAX. OBS. = 0



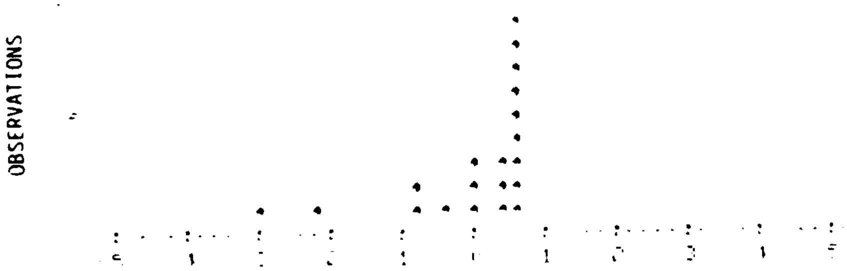
OTHER INDUSTRY

NO. OBS. = 8
MEAN = -5.9
STD. DEV. = 8.5
MIN. OBS. = -25
MAX. OBS. = 0



ALL RESPONSES

NO. OBS. = 20
MIN. OBS. = -25
MAX. OBS. = 0



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = -4.7   STD. DEV. = 7.0

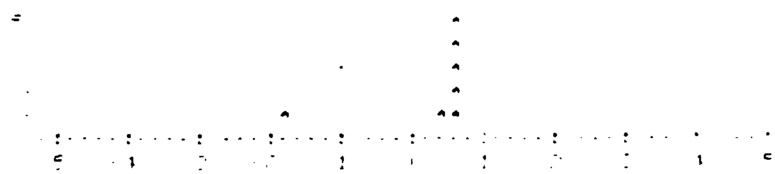
Q23 - PERCENT CHANGE IN TOOLING FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -7%
STD. DEV. = 8.9%
MIN. OBS. = -20%
MAX. OBS. = 0%

OTHER AEROSPACE

NO. OBS. = 7
MEAN = -3.3%
STD. DEV. = 7.4%
MIN. OBS. = -20%
MAX. OBS. = 0%

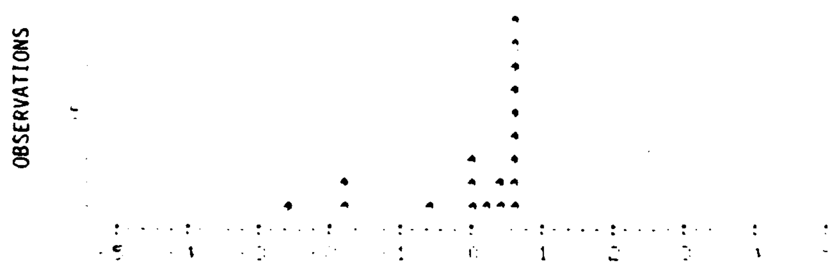


OTHER INDUSTRY

NO. OBS. = 8
MEAN = -5.9%
STD. DEV. = 8.5%
MIN. OBS. = -25%
MAX. OBS. = 0%

ALL RESPONSES

NO. OBS. = 19
MIN. OBS. = -25%
MAX. OBS. = 0%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = -5.2% STD. DEV. = 7.9%

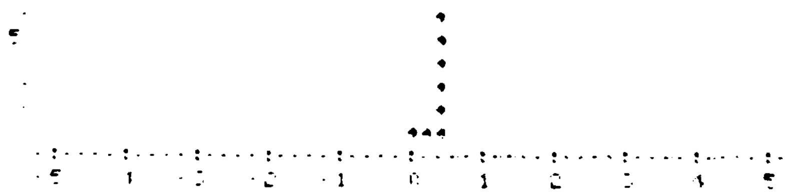
023 - PERCENT CHANGE IN WORK IN PROCESS INVENTORY FOR CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -0.8%
STD. DEV. = 1.5%
MIN. OBS. = -0.3%
MAX. OBS. = 0%

OTHER AEROSPACE

NO. OBS. = 8
MEAN = -0.4%
STD. DEV. = 0.7%
MIN OBS. = -0.2%
MAX OBS. = 0%

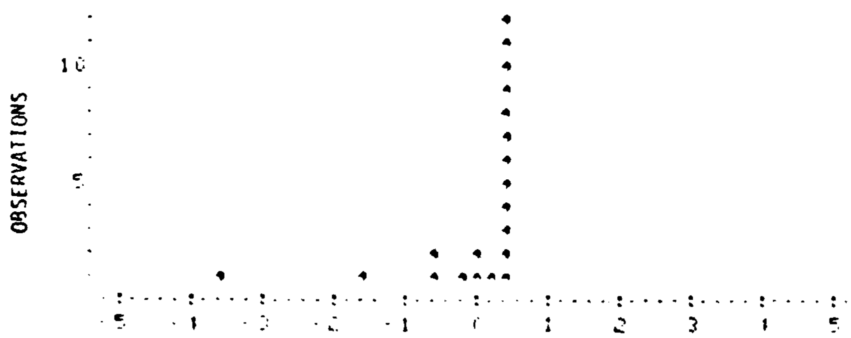


OTHER INDUSTRY

NO. OBS. = 8
MEAN = -5.3%
STD. DEV. = 6.9%
MIN. OBS. = -20%
MAX. OBS. = 0%

ALL RESPONSES

NO. OBS. = 20
MIN. OBS. = -20%
MAX. OBS. = 0%



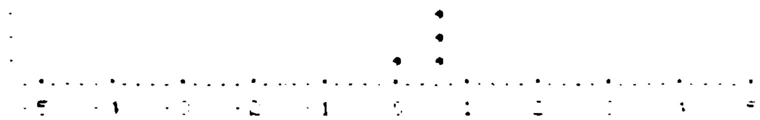
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -2.4% STD. DEV. = 4.9%

Q23 - PERCENT CHANGE IN WORK IN PROCESS INVENTORY FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 0.8%
STD. DEV. = 1.5%
MIN. OBS. = -3.0%
MAX. OBS. = 0%

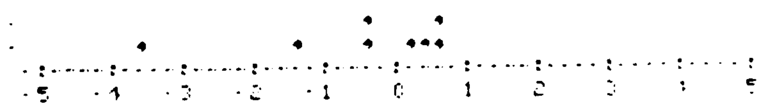


OTHER AEROSPACE

NO. OBS. = 7
MEAN = -0.4%
STD. DEV. = 0.8%
MIN. OBS. = -2.0%
MAX. OBS. = 0%

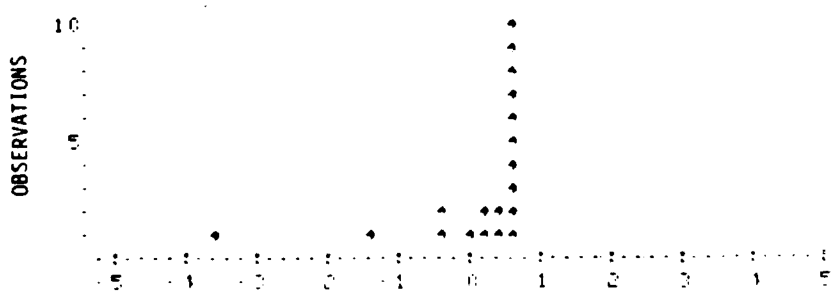
OTHER INDUSTRY

NO. OBS. = 8
MEAN = -5.3%
STD. DEV. = 6.9%
MIN. OBS. = -20.%
MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 19
MIN. OBS. = -20%
MAX. OBS. = 0%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = -2.6% STD. DEV. = 5.0%

Q24 - IMPACT OF SYSTEM 1 ON OTHER AREAS (RANKED ON A SCALE OF -2 TO +2, WHERE -2 = SIGNIFICANTLY NEGATIVE IMPACT, 0 = NO CHANGE, +2 = SIGNIFICANT IMPROVEMENT)

AREAS IMPACTED	MISSILE PRIME AND SUBS.					OTHER AEROSPACE					OTHER INDUSTRY					TOTAL				
	-2	-1	0	+1	+2	-2	-1	0	+1	+2	-2	-1	0	+1	+2	-2	-1	0	+1	+2
PRODUCTION LEADTIME			1	3				5	3					6	3			6	12	3
PROCESS PLANNING LEADTIME		1		1	2				6	2				6	3		1		13	7
MACHINE UTILIZATION			3		1			6	2				4	2	3			13	4	4
PRODUCT QUALITY			2	2				6	2				5	4				13	8	
DIRECT LABOR UTILIZATION			3	1				4	3	1			5	4				12	8	1
UNIFORMITY OF PROCESS PLANS				1	3				6	2				4	5				11	10
COST ESTIMATING PROCEDURES			1	2	1			1	6	1				6	3			2	14	5
MAKE/BUY DECISIONS			1	3				5	3				1	6	2			7	12	2
PRODUCT STANDARDIZATION			1	2	1			4	2	2			4	3	2			9	7	5
CRITICAL LABOR SKILLS			2	2				6	2				8		1			16	4	1
MATERIAL STANDARDIZATION			1	2	1			5	2	1			5	4				11	8	2
PRODUCIBILITY OF PARTS			2	2				3	4				4	5				9	11	
PLANT LAYOUT			4					6	1	1			3	6				13	7	1
MATERIAL HANDLING			2	2				5	2	1			4	3	2			11	7	3
PRODUCTION SCHEDULING			3		1			6	1					5	4			9	6	5
CAPACITY PLANNING			2	2				6	1					5	4			8	8	4

Q25 - COST TO ACQUIRE HARDWARE -- SYSTEM 1 FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

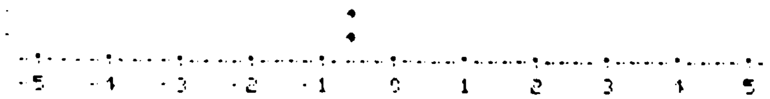
NO. OBS.	=	3
MEAN	=	$ 76K
STD. DEV.	=	$ 108K
MIN. OBS.	=	$ 8K
MAX. OBS.	=	$ 200K

OTHER AEROSPACE

NO. OBS.	=	1
MEAN	=	$ 10K
STD. DEV.	=	$ 0K
MIN. OBS.	=	$ 10K
MAX. OBS.	=	$ 10K

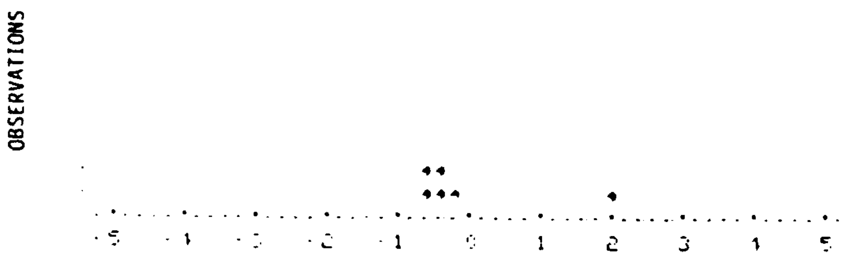
OTHER INDUSTRY

NO. OBS.	=	2
MEAN	=	$ 0K
STD. DEV.	=	$ 0K
MIN. OBS.	=	$ 0K
MAX. OBS.	=	$ 0K



ALL RESPONSES

NO. OBS.	=	6
MIN. OBS.	=	$ 0K
MAX. OBS.	=	$ 200K



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $40K STD. DEV. = $79K

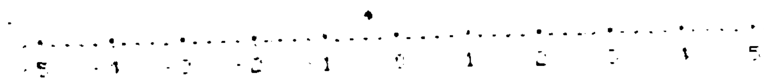
25 - COST TO ACQUIRE HARDWARE -- SYSTEM 1 FOR NON-CYLINDRICAL PARTS

ISSILE PRIMES & SUBS

IO. OBS. = 3
IEAN = $ 76K
STD. DEV. = $ 108K
MIN. OBS. = $ 8K
MAX. OBS. = $ 200K

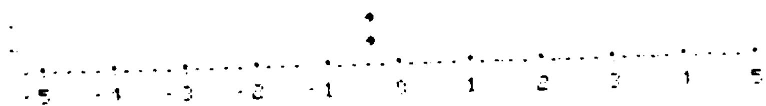
OTHER AEROSPACE

NO. OBS. = 1
MEAN = $ 0K
STD. DEV. = $ 0K
MIN. OBS. = $ 0K
MAX. OBS. = $ 0K



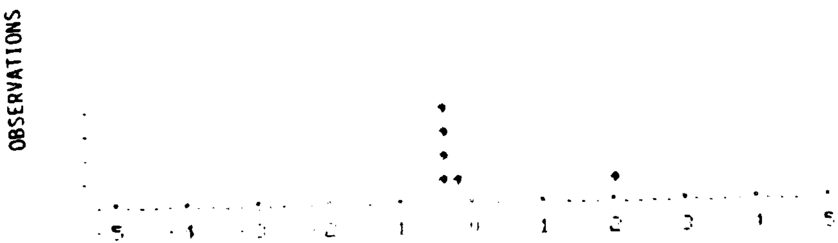
OTHER INDUSTRY

NO. OBS. = 2
MEAN = $ 0K
STD. DEV. = $ 0K
MIN. OBS. = $ 0K
MAX. OBS. = $ 0K



ALL RESPONSES

NO. OBS. = 6
MIN. OBS. = $ 0K
MAX. OBS. = $ 200K

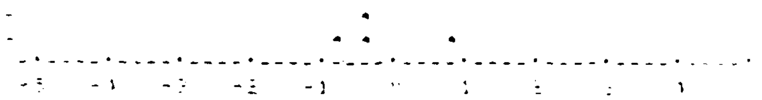


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $38K STD. DEV. = $80K

MONTHS TO TEST SYSTEM -- SYSTEM 1 FOR NON-CYLINDRICAL PARTS

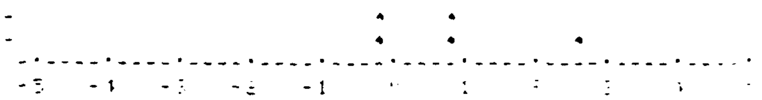
E PRIMES & SUBS

.S.	=	4
	=	2.8 mo.
)EV.	=	2.2 mo.
)BS.	=	1 mo.
)BS.	=	6 mo.



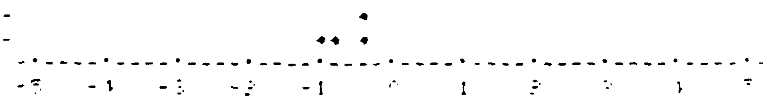
AEROSPACE

3S.	=	5
	=	6 mo.
DEV.	=	3.7 mo.
OBS.	=	3 mo.
OBS.	=	12 mo.



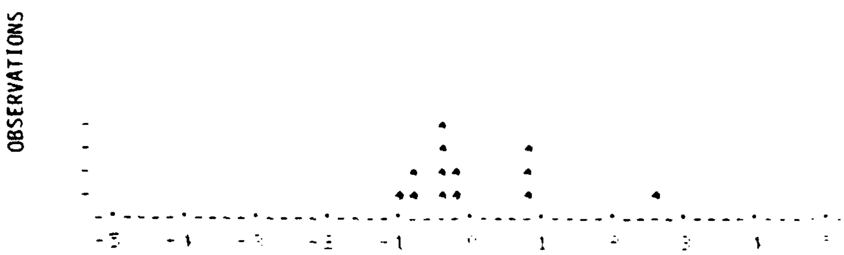
INDUSTRY

BS.	=	4
	=	1.4 mo.
DEV.	=	.75 mo.
OBS.	=	0.5 mo.
OBS.	=	2 mo.



RESPONSES

OBS.	=	13
OBS.	=	0.5 mo.
OBS.	=	12 mo.



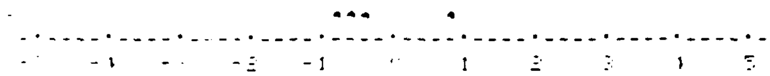
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 3.6 mo. STD. DEV. = 3.2 mo.

Q25 - MONTHS TO TEST SYSTEM -- SYSTEM 1 FOR CYLINDRICAL PARTS

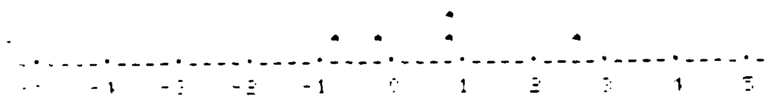
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 2.6 mo.
STD. DEV. = 2.3 mo.
MIN. OBS. = 1 mo.
MAX. OBS. = 6 mo.



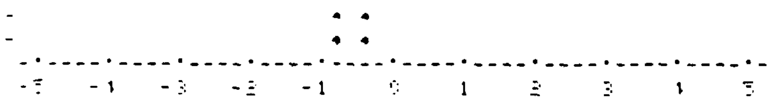
OTHER AEROSPACE

NO. OBS. = 5
MEAN = 5.5 mo.
STD. DEV. = 4.3 mo.
MIN. OBS. = 9.5 mo.
MAX. OBS. = 12 mo.



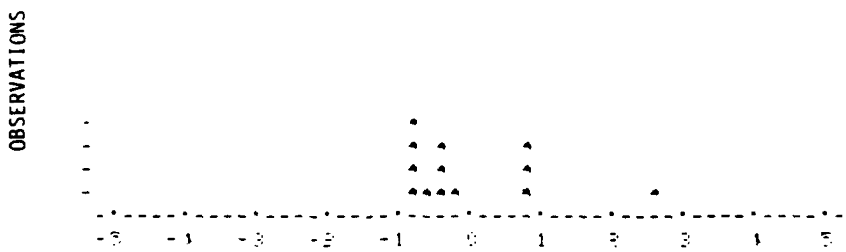
OTHER INDUSTRY

NO. OBS. = 4
MEAN = 1.4 mo.
STD. DEV. = 0.8 mo.
MIN. OBS. = 0.5 mo.
MAX. OBS. = 2 mo.



ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = 0.5 mo.
MAX. OBS. = 2 mo.



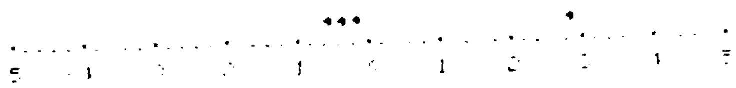
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 3.3 mo. STD. DEV. = 3.3 mo.

125 - MONTHS TO TRAIN PERSONNEL -- SYSTEM 1 FOR NON-CYLINDRICAL PARTS

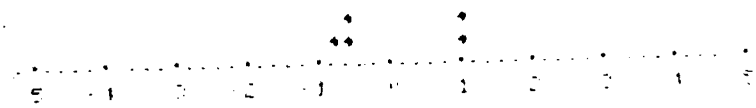
ISSILE PRIMES & SUBS

O. OBS. = 4
EAN = 2.8 mo.
TD. DEV. = 3.3 mo.
IN. OBS. = 1 mo.
AX. OBS. = 12 mo.



THER AEROSPACE

NO. OBS. = 5
MEAN = 2.75 mo.
STD. DEV. = 2.9 mo.
MIN. OBS. = .25 mo.
MAX. OBS. = 6 mo.

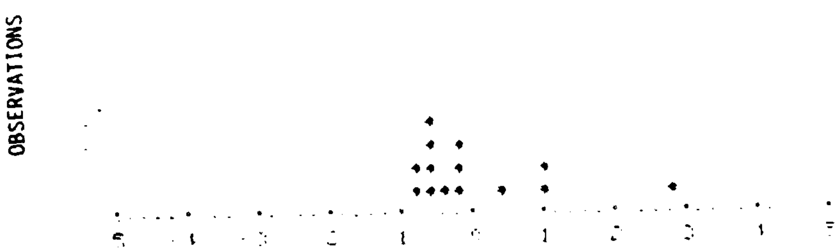


OTHER INDUSTRY

NO. OBS. = 5
MEAN = 1.7 mo.
STD. DEV. = 1.5 mo.
MIN. OBS. = 0.1 mo.
MAX. OBS. = 4 mo.

ALL RESPONSES

NO. OBS. = 14
MIN. OBS. = 0.1 mo.
MAX. OBS. = 12 mo.



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 2.8 mo. STD. DEV. = 3.3 mo.

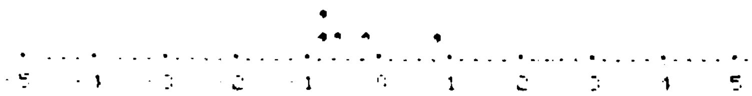
Q25 - MONTHS TO TRAIN PERSONNEL -- SYSTEM 1 FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	4.1 mo.
STD. DEV.	=	5.26 mo.
MIN. OBS.	=	1 mo.
MAX. OBS.	=	12 mo.

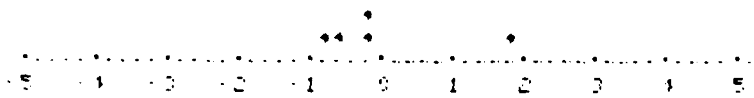
OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	1.9 mo.
STD. DEV.	=	2.4 mo.
MIN. OBS.	=	0.25 mo.
MAX. OBS.	=	6 mo.



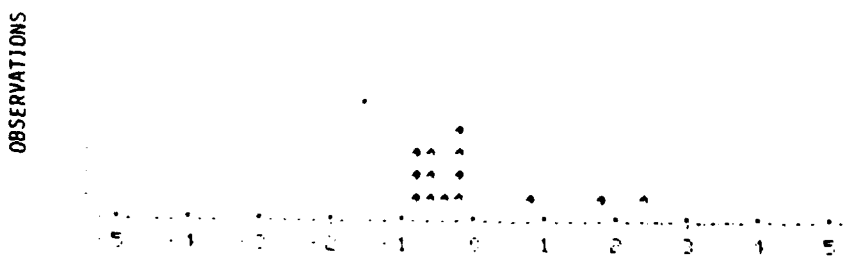
OTHER INDUSTRY

NO. OBS.	=	5
MEAN	=	2.9 mo.
STD. DEV.	=	4.1 mo.
MIN. OBS.	=	0.1 mo.
MAX. OBS.	=	10 mo.



ALL RESPONSES

NO. OBS.	=	14
MIN. OBS.	=	0.1 mo.
MAX. OBS.	=	12 mo.



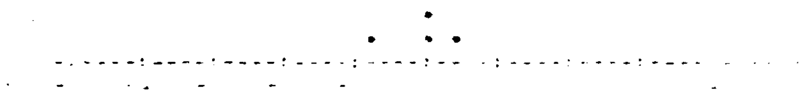
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 2.9 mo. STD. DEV. = 3.8 mo.

25 - MONTHS TO ESTABLISH INITIAL DATA FILES -- SYSTEM 1 FOR NON-CYLINDRICAL PARTS

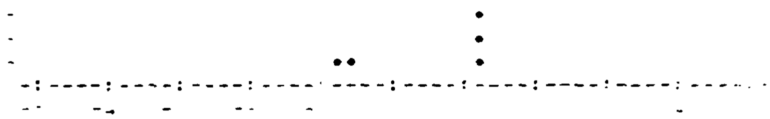
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 5.75 mo.
STD. DEV. = 2.1 mo.
MIN. OBS. = 3 mo.
MAX. OBS. = 8 mo.



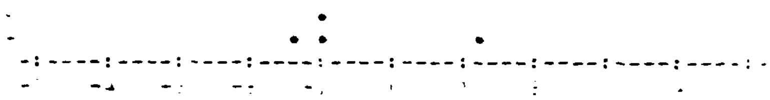
OTHER AEROSPACE

NO. OBS. = 5
MEAN = 8.6 mo.
STD. DEV. = 4.7 mo.
MIN. OBS. = 3 mo.
MAX. OBS. = 12 mo.



OTHER INDUSTRY

NO. OBS. = 4
MEAN = 4 mo.
STD. DEV. = 5.4 mo.
MIN. OBS. = 0 mo.
MAX. OBS. = 12 mo.



ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = 0 mo.
MAX. OBS. = 12 mo.

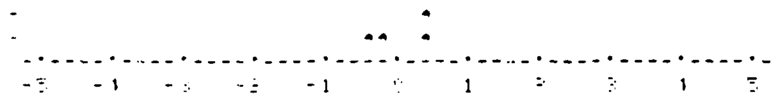
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 6.3 mo. STD. DEV. = 4.4 mo.

Q25 - MONTHS TO ESTABLISH INITIAL DATA FILES -- SYSTEM 1 FOR CYLINDRICAL PARTS

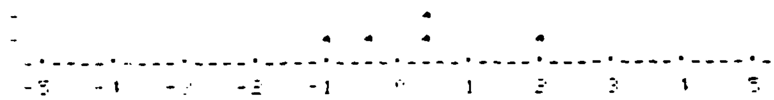
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	4.75 mo.
STD. DEV.	=	1.5 mo.
MIN. OBS.	=	3 mo.
MAX. OBS.	=	6 mo.



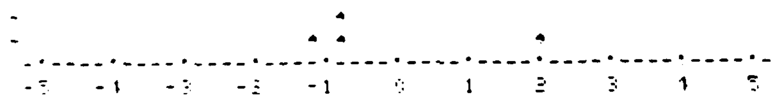
OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	5.6 mo.
STD. DEV.	=	4.2 mo.
MIN. OBS.	=	1 mo.
MAX. OBS.	=	12 mo.



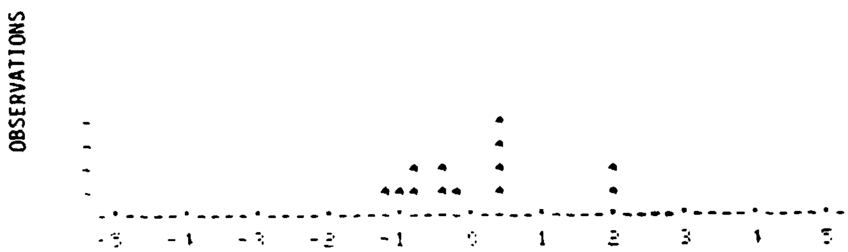
OTHER INDUSTRY

NO. OBS.	=	4
MEAN	=	4 mo.
STD. DEV.	=	5.4 mo.
MIN. OBS.	=	0 mo.
MAX. OBS.	=	12 mo.



ALL RESPONSES

NO. OBS.	=	13
MIN. OBS.	=	0 mo.
MAX. OBS.	=	12 mo.

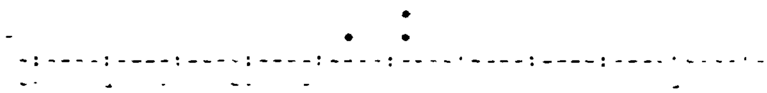


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 4.3 mo. STD. DEV. = 3.76 mo.

Q25 - MONTHS TO ACQUIRE HARDWARE -- SYSTEM 1 FOR NON-CYLINDRICAL PARTS

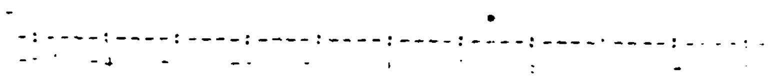
MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	7.3 mo.
STD. DEV.	=	1.2 mo.
MIN. OBS.	=	1 mo.
MAX. OBS.	=	3 mo.



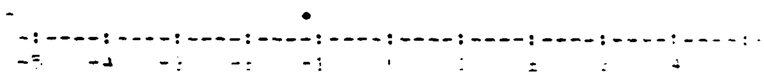
OTHER AEROSPACE

NO. OBS.	=	1 mo.
MEAN	=	6.0 mo.
STD. DEV.	=	10 mo.
MIN. OBS.	=	6 mo.
MAX. OBS.	=	6 mo.



OTHER INDUSTRY

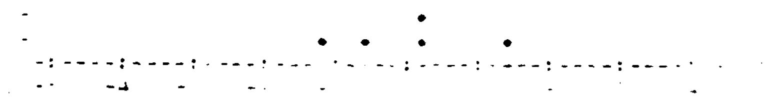
NO. OBS.	=	1 mo.
MEAN	=	0 mo.
STD. DEV.	=	0 mo.
MIN. OBS.	=	0 mo.
MAX. OBS.	=	0 mo.



OBSERVATIONS

ALL RESPONSES

NO. OBS.	=	5
MIN. OBS.	=	0 mo.
MAX. OBS.	=	6 mo.



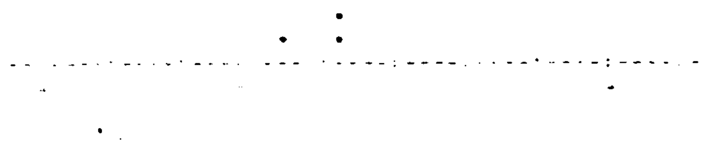
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 2.6 mo. STD. DEV. = 2.3 mo.

Q25 - MONTHS TO ACQUIRE HARDWARE -- SYSTEM 1 FOR CYLINDRICAL PARTS

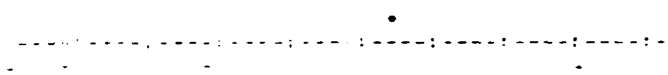
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 2.3 mo.
STD. DEV. = 1.2 mo.
MIN. OBS. = 1 mo.
MAX. OBS. = 3 mo.



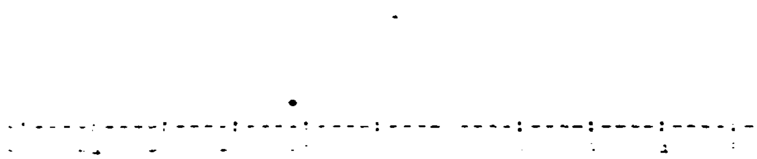
OTHER AEROSPACE

NO. OBS. = 1
MEAN = 6 mo.
STD. DEV. = 0 mo.
MIN. OBS. = 6 mo.
MAX. OBS. = 6 mo.



OTHER INDUSTRY

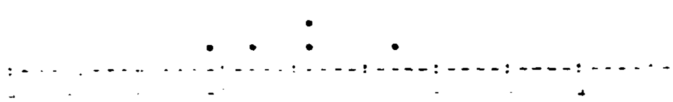
NO. OBS. = 1
MEAN = 0 mo.
STD. DEV. = 0 mo.
MIN. OBS. = 0 mo.
MAX. OBS. = 0 mo.



ALL RESPONSES

NO. OBS. = 5
MIN. OBS. = 0 mo.
MAX. OBS. = 6 mo.

OBSERVATIONS

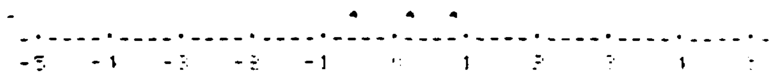


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 2.6 mo. STD. DEV. = 2.3 mo.

Q25 - COST TO TEST SYSTEM -- SYSTEM 1 FOR NON-CYLINDRICAL PARTS

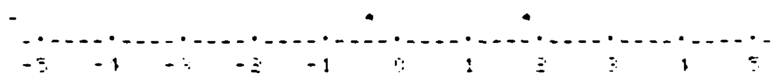
MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	$9.8K
STD. DEV.	=	$4.8K
MIN. OBS.	=	$5.0K
MAX. OBS.	=	$14.5K



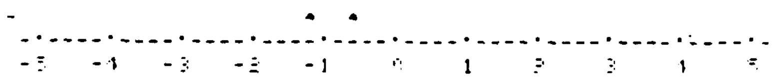
OTHER AEROSPACE

NO. OBS.	=	2
MEAN	=	$13.2K
STD. DEV.	=	$9.6K
MIN. OBS.	=	$6.4K
MAX. OBS.	=	$ 20K



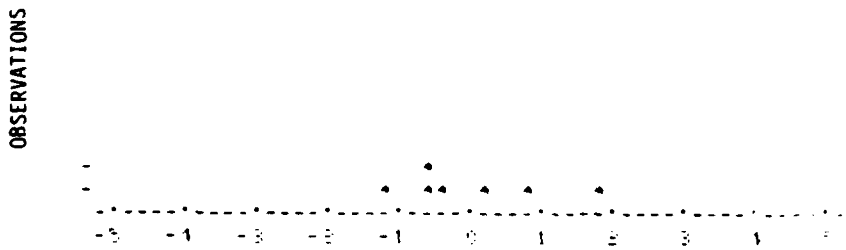
OTHER INDUSTRY

NO. OBS.	=	2
MEAN	=	$3.0K
STD. DEV.	=	$2.9K
MIN. OBS.	=	$1.0K
MAX. OBS.	=	$5.0K



ALL RESPONSES

NO. OBS.	=	7
MIN. OBS.	=	$ 1K
MAX. OBS.	=	$ 20K



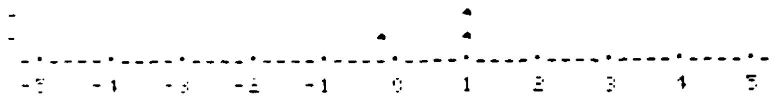
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $8.8K STD. DEV. = $6.5K

Q25 - COST TO TEST SYSTEM -- SYSTEM 1 FOR CYLINDRICAL PARTS

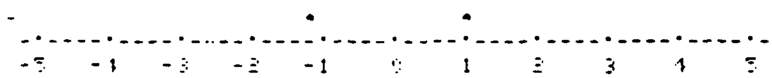
MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	$8.6K
STD. DEV.	=	$3.1K
MIN. OBS.	=	$10.8K
MAX. OBS.	=	$5K



OTHER AEROSPACE

NO. OBS.	=	2
MEAN	=	$5.5K
STD. DEV.	=	$6.4K
MIN. OBS.	=	$ 1K
MAX. OBS.	=	$ 10K

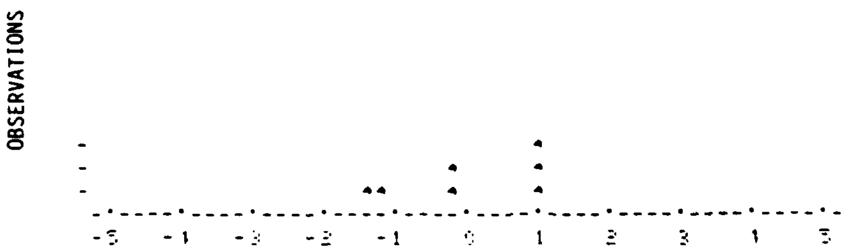


OTHER INDUSTRY

NO. OBS.	=	2
MEAN	=	$2.5K
STD. DEV.	=	$3.5K
MIN. OBS.	=	$0.05K
MAX. OBS.	=	$ 5K

ALL RESPONSES

NO. OBS.	=	7
MIN. OBS.	=	$.05K
MAX. OBS.	=	$10.8K



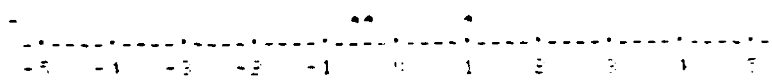
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $ 5.9K STD. DEV. = $ 4.4K

Q25 - COST TO TRAIN PERSONNEL -- SYSTEM 1 FOR NON-CYLINDRICAL PARTS

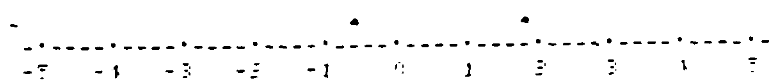
MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	$8.5K
STD. DEV.	=	$ 10K
MIN. OBS.	=	$ 2K
MAX. OBS.	=	$2.0K



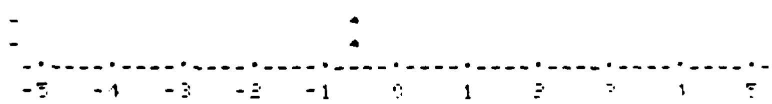
OTHER AEROSPACE

NO. OBS.	=	2
MEAN	=	$16.5K
STD. DEV.	=	$19.1K
MIN. OBS.	=	$ 3K
MAX. OBS.	=	$ 30K



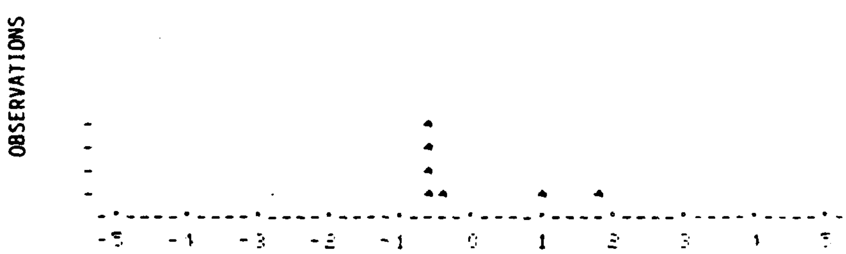
OTHER INDUSTRY

NO. OBS.	=	2
MEAN	=	$ 1.5K
STD. DEV.	=	$ .7K
MIN. OBS.	=	$ 1.0K
MAX. OBS.	=	$ 2K



ALL RESPONSES

NO. OBS.	=	7
MIN. OBS.	=	$ 1K
MAX. OBS.	=	$ 20K



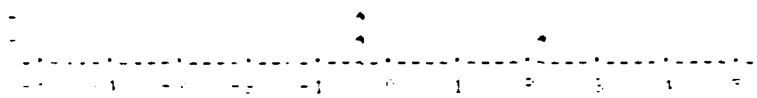
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $8.8K STD. DEV. = $11.4K

Q25 - COST TO TRAIN PERSONNEL -- SYSTEM 1 FOR CYLINDRICAL PARTS

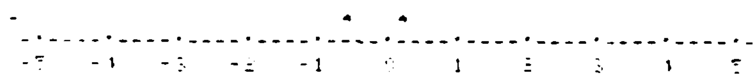
MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	$ 8.2K
STD. DEV.	=	$10.3K
MIN. OBS.	=	$ 2K
MAX. OBS.	=	$ 20K



OTHER AEROSPACE

NO. OBS.	=	2
MEAN	=	$ 3.5K
STD. DEV.	=	$ 3.5K
MIN. OBS.	=	$ 1K
MAX. OBS.	=	$ 6K

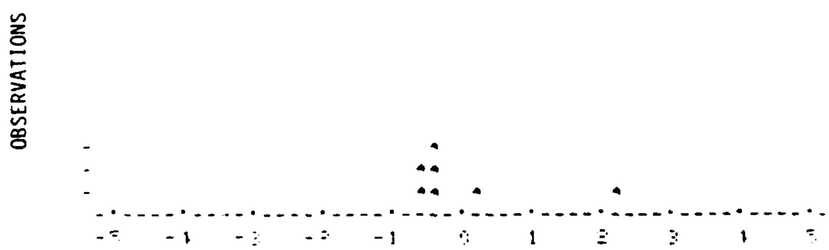


OTHER INDUSTRY

NO. OBS.	=	2
MEAN	=	$ 1.0K
STD. DEV.	=	$ 1.3K
MIN. OBS.	=	$ 0.1K
MAX. OBS.	=	$ 2K

ALL RESPONSES

NO. OBS.	=	7
MIN. OBS.	=	$ 0.1K
MAX. OBS.	=	$ 20K



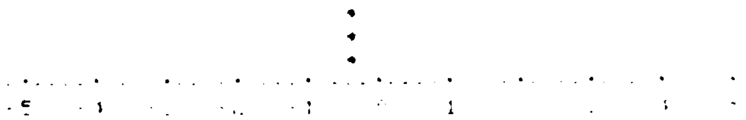
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $ 4.8K STD. DEV. = $ 7.0K

Q25 - COST TO ESTABLISH INITIAL DATA FILES -- SYSTEM 1 FOR NON-CYLINDRICAL PARTS

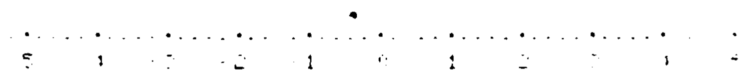
MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	$38.7K
STD. DEV.	=	$ 10K
MIN. OBS.	=	$31.2K
MAX. OBS.	=	$ 50K



OTHER AEROSPACE

NO. OBS.	=	1
MEAN	=	$ 8K
STD. DEV.	=	$ 0K
MIN. OBS.	=	$ 8K
MAX. OBS.	=	$ 8K

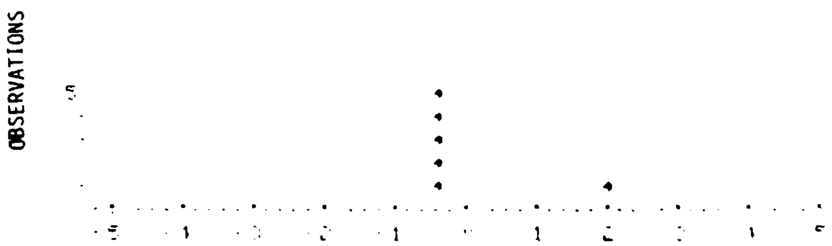


OTHER INDUSTRY

NO. OBS.	=	2
MEAN	=	$1425K
STD. DEV.	=	$2016K
MIN. OBS.	=	$ 0K
MAX. OBS.	=	$2850K

ALL RESPONSES

NO. OBS.	=	6
MIN. OBS.	=	$ 0K
MAX. OBS.	=	$2850K



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $ 495.7K STD. DEV. = $ 1153 5K

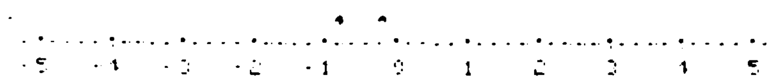
Q25 - COST TO ESTABLISH INITIAL DATA FILES -- SYSTEM 1 FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	$ 33K
STD. DEV.	=	$14.7K
MIN. OBS.	=	$ 24K
MAX. OBS.	=	$ 50K

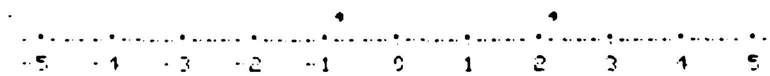
OTHER AEROSPACE

NO. OBS.	=	2
MEAN	=	$13.5K
STD. DEV.	=	$16.3K
MIN. OBS.	=	$ 2K
MAX. OBS.	=	$ 25K



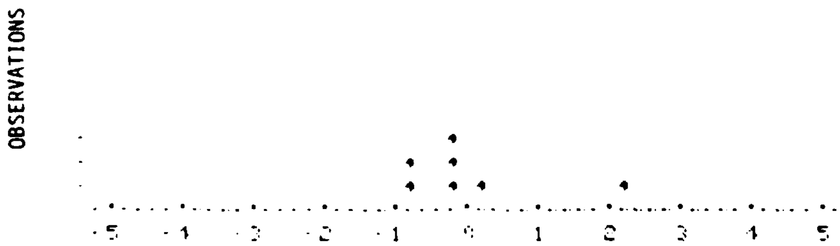
OTHER INDUSTRY

NO. OBS.	=	2
MEAN	=	$ 75K
STD. DEV.	=	$106.1K
MIN. OBS.	=	$ 0K
MAX. OBS.	=	$ 150K



ALL RESPONSES

NO. OBS.	=	7
MIN. OBS.	=	$ 0K
MAX. OBS.	=	$ 150K



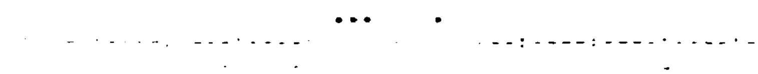
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $39.9K STD. DEV. = $51.6K

Q25 - ANNUAL COMPUTER CHARGES AND PROGRAM MAINTENANCE -- SYSTEM 1 FOR CYLINDRICAL PARTS

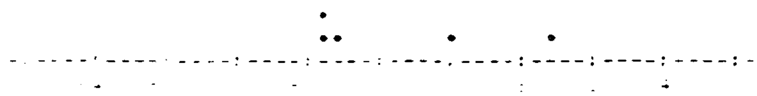
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	$22.2K
STD. DEV.	=	$20.6K
MIN. OBS.	=	$ 5K
MAX. OBS.	=	$51.6K



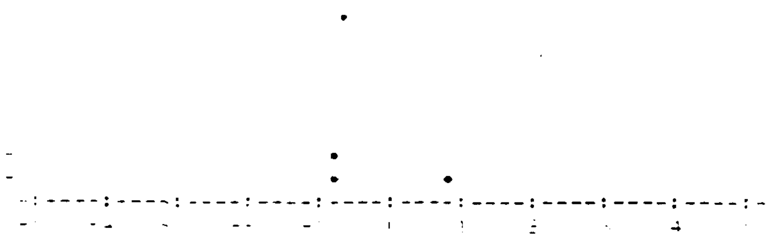
OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	$34.2K
STD. DEV.	=	$42.7K
MIN. OBS.	=	$ 3K
MAX. OBS.	=	$ 100K



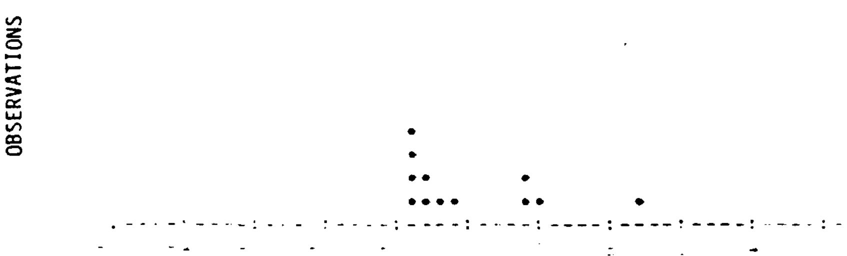
OTHER INDUSTRY

NO. OBS.	=	3
MEAN	=	$17.0K
STD. DEV.	=	$28.6K
MIN. OBS.	=	$ 0.5K
MAX. OBS.	=	$ 50K



ALL RESPONSES

NO. OBS.	=	12
MIN. OBS.	=	$ 0.5K
MAX. OBS.	=	$ 100K



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $25.9K STD. DEV. = $31.4K

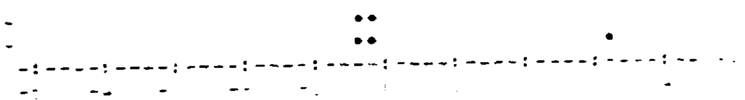
Q25 - ANNUAL COMPUTER CHARGES AND PROGRAM MAINTENANCE -- SYSTEM 1 FOR NON-CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	$26.2K
STD. DEV.	=	$20.9K
MIN. OBS.	=	$ 10K
MAX. OBS.	=	$56.8K

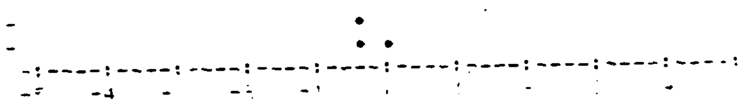
OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	$92.9K
STD. DEV.	=	$ 172K
MIN. OBS.	=	$ 4.5K
MAX. OBS.	=	$ 400K



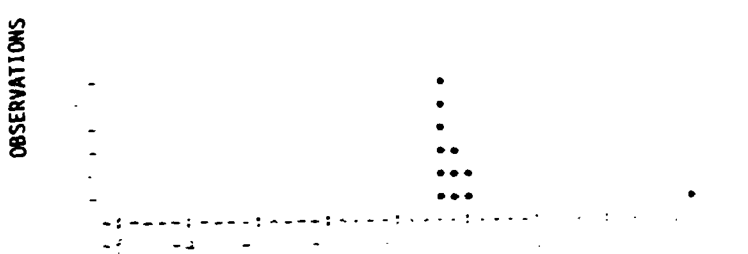
OTHER INDUSTRY

NO. OBS.	=	3
MEAN	=	$19.7K
STD. DEV.	=	$26.6K
MIN. OBS.	=	$ 0.5K
MAX. OBS.	=	$ 50K



ALL RESPONSES

NO. OBS.	=	12
MIN. OBS.	=	$0.5K
MAX. OBS.	=	$400K



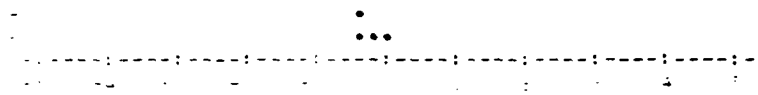
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $52.4K STD. DEV. $110.8K

Q25 - ANNUAL COST TO UPDATE DATA FILES -- SYSTEM 1 FOR CYLINDRICAL PARTS

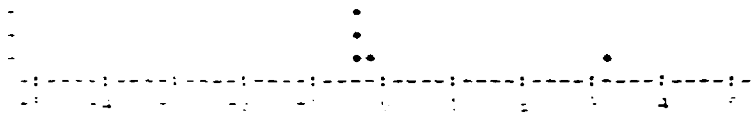
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	$ 7.0K
STD. DEV.	=	$ 5.0K
MIN. OBS.	=	$ 0.8K
MAX. OBS.	=	$ 10K



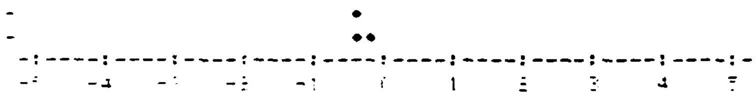
OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	$23.7K
STD. DEV.	=	$42.8K
MIN. OBS.	=	$ 2K
MAX. OBS.	=	$ 100K



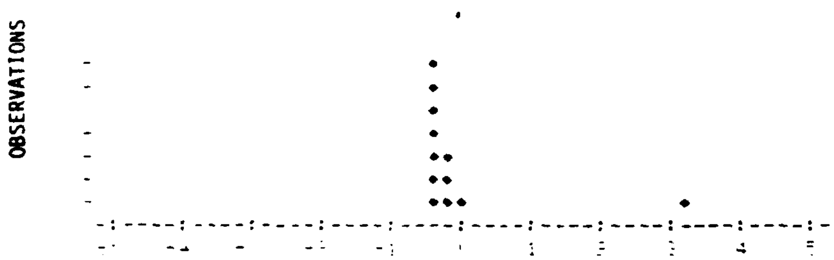
OTHER INDUSTRY

NO. OBS.	=	3
MEAN	=	$ 5.0K
STD. DEV.	=	$ 5.0K
MIN. OBS.	=	$0.05K
MAX. OBS.	=	$ 10K



ALL RESPONSES

NO. OBS.	=	12
MIN. OBS.	=	$0.05K
MAX. OBS.	=	$ 100K



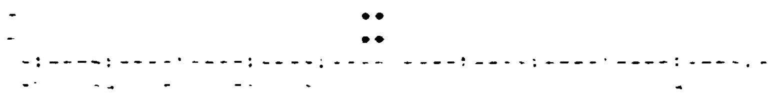
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $13.4K   STD. DEV. = $27.6K

Q25 - ANNUAL COST TO UPDATE DATA FILES -- SYSTEM 1 FOR NON-CYLINDRICAL PARTS

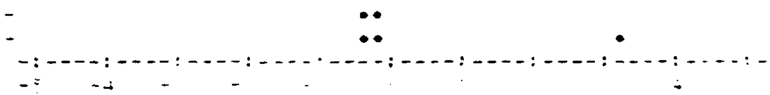
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	$ 9K
STD. DEV.	=	$ 6.7K
MIN. OBS.	=	$ 1.6K
MAX. OBS.	=	$ 15K



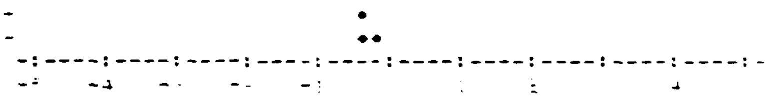
OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	$85.3K
STD. DEV.	=	$ 176K
MIN. OBS.	=	$ 6K
MAX. OBS.	=	$ 400K



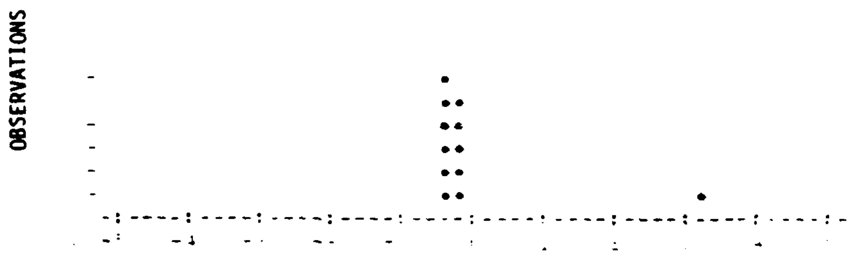
OTHER INDUSTRY

NO. OBS.	=	3
MEAN	=	$ 5.3K
STD. DEV.	=	$ 4.5K
MIN. OBS.	=	$0.95K
MAX. OBS.	=	$ 10K



ALL RESPONSES

NO. OBS.	=	12
MIN. OBS.	=	$0.95K
MAX. OBS.	=	$ 400K



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $39.9K STD. DEV. = $113.5K

Q27 - PERCENT CHANGE IN PROCESS PLANNING FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	-26.7%
STD. DEV.	=	20.8%
MIN. OBS.	=	-50%
MAX. OBS.	=	-10%

OTHER AEROSPACE

NO. OBS.	=	7
MEAN	=	-30.7%
STD. DEV.	=	19.1%
MIN. OBS.	=	-60%
MAX. OBS.	=	-2%

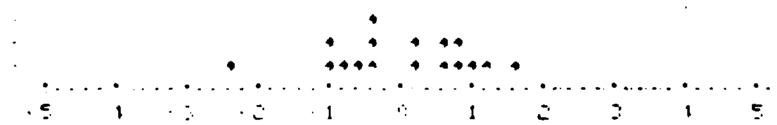
OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	-52.1%
STD. DEV.	=	23.9%
MIN. OBS.	=	-93%
MAX. OBS.	=	-15%

ALL RESPONSES

NO. OBS.	=	17
MIN. OBS.	=	-93%
MAX. OBS.	=	-2%

OBSERVATIONS



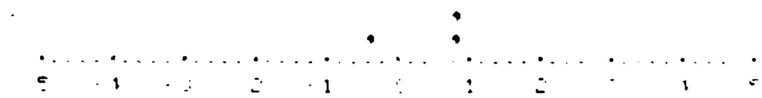
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -38.8% STD. DEV. = 23.2%

Q27 - PERCENT CHANGE IN PROCESS PLANNING FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

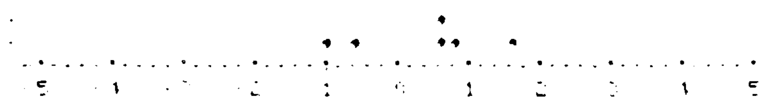
MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	-30%
STD. DEV.	=	17.3%
MIN. OBS.	=	-50%
MAX. OBS.	=	-20%



OTHER AEROSPACE

NO. OBS.	=	6
MEAN	=	-31.1%
STD. DEV.	=	21.7%
MIN. OBS.	=	-60%
MAX. OBS.	=	-3%

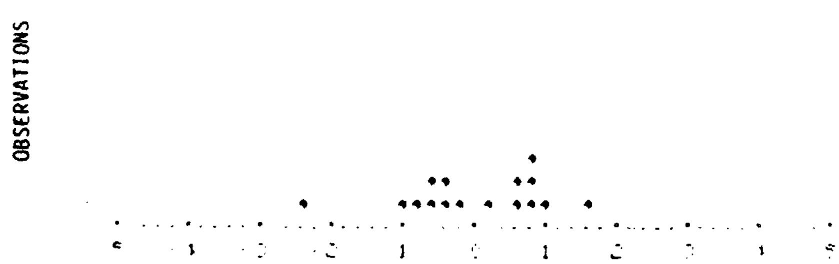


OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	-50%
STD. DEV.	=	23.8%
MIN. OBS.	=	-93%
MAX. OBS.	=	-15%

ALL RESPONSES

NO. OBS.	=	16
MIN. OBS.	=	-93%
MAX. OBS.	=	-3%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -39.2% STD. DEV. = 22.8%

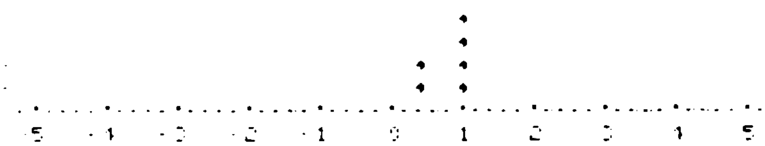
Q27 - PERCENT CHANGE IN DETERMINING OPERATION SEQUENCES FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = -40%
STD. DEV. = 35%
MIN. OBS. = -75%
MAX. OBS. = -5%

OTHER AEROSPACE

NO. OBS. = 6
MEAN = -11.7%
STD. DEV. = 10.7%
MIN. OBS. = -25%
MAX. OBS. = -3%

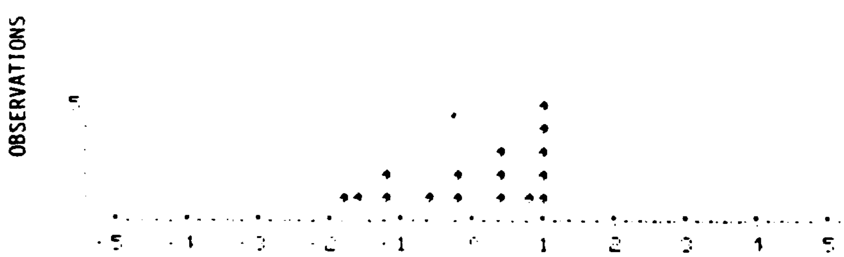


OTHER INDUSTRY

NO. OBS. = 7
MEAN = -55%
STD. DEV. = 33.4%
MIN. OBS. = -95%
MAX. OBS. = -10%

ALL RESPONSES

NO. OBS. = 16
MIN. OBS. = -95%
MAX. OBS. = -5%



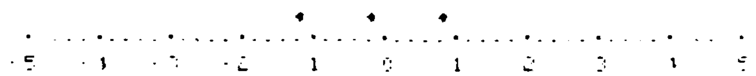
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -35.8% STD. DEV. = 32.7%

Q27 - PERCENT CHANGE IN DETERMINING OPERATION SEQUENCES FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

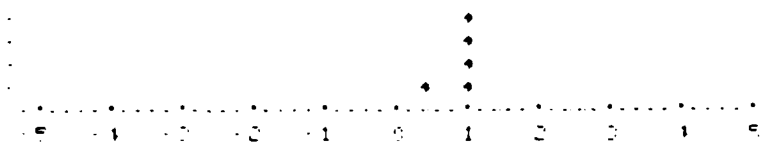
MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	-41%
STD. DEV.	=	33.5%
MIN. OBS.	=	-75%
MAX. OBS.	=	-8%



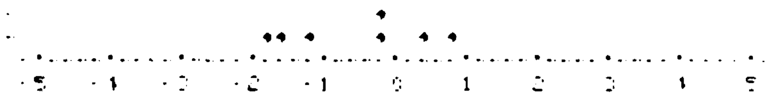
OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	-8.4%
STD. DEV.	=	9.3%
MIN. OBS.	=	-25%
MAX. OBS.	=	-3%



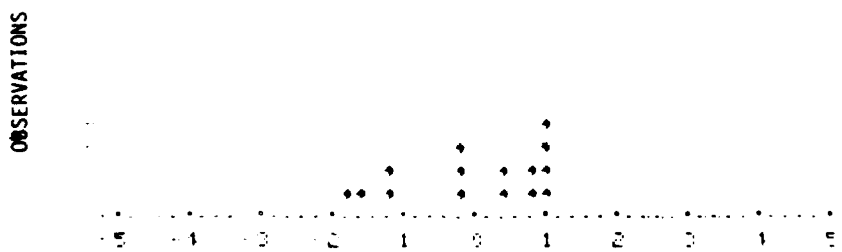
OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	-52.9%
STD. DEV.	=	33.7%
MIN. OBS.	=	-95%
MAX. OBS.	=	-10%



ALL RESPONSES

NO. OBS.	=	15
MIN. OBS.	=	-95%
MAX. OBS.	=	-8%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -35.7% STD. DEV. = 33.1%

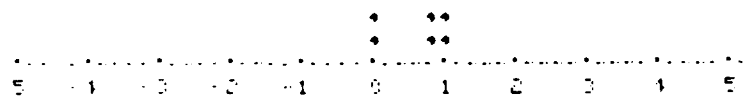
Q27 - PERCENT CHANGE IN MACHINE SELECTION FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS.	=	2
MEAN	=	-58.0%
STD. DEV.	=	24.7%
MIN. OBS.	=	-75%
MAX. OBS.	=	40%

OTHER AEROSPACE

NO. OBS.	=	6
MEAN	=	-10.3%
STD. DEV.	=	12.0%
MIN. OBS.	=	-25%
MAX. OBS.	=	0%



OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	-33.0%
STD. DEV.	=	29.0%
MIN. OBS.	=	-80%
MAX. OBS.	=	-10%

OBSERVATIONS

ALL RESPONSES

NO. OBS.	=	15
MIN. OBS.	=	-80%
MAX. OBS.	=	0%

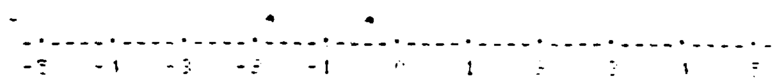
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -27.1% STD. DEV. = 27.0%

Q27 - PERCENT CHANGE IN MACHINE SELECTION FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

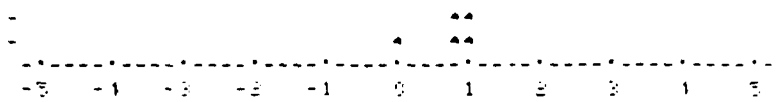
MISSILE PRIMES & SUBS

NO. OBS. = 2
MEAN = -57.5%
STD. DEV. = 24.7%
MIN. OBS. = -75%
MAX. OBS. = -40%



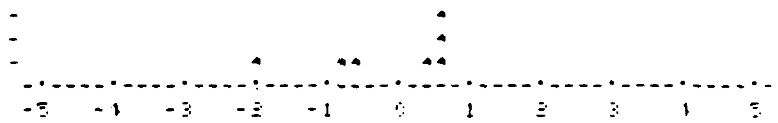
OTHER AEROSPACE

NO. OBS. = 5
MEAN = - 7.4%
STD. DEV. = 10.1%
MIN. OBS. = -25%
MAX. OBS. = 0%



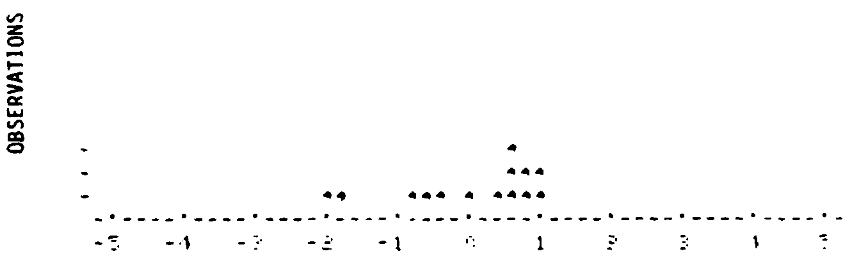
OTHER INDUSTRY

NO. OBS. = 7
MEAN = -31.4%
STD. DEV. = 27.5%
MIN. OBS. = -80%
MAX. OBS. = -10%



ALL RESPONSES

NO. OBS. = 14
MIN. OBS. = -80%
MAX. OBS. = 0%

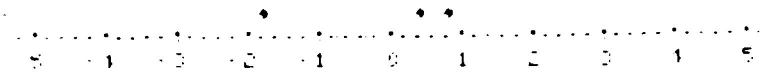


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = - 26.6%   STD. DEV. = 27%

Q27 - PERCENT CHANGE IN SELECTING TOOLING FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = -31.3%
STD. DEV. = 38.5%
MIN. OBS. = -75%
MAX. OBS. = - 2%

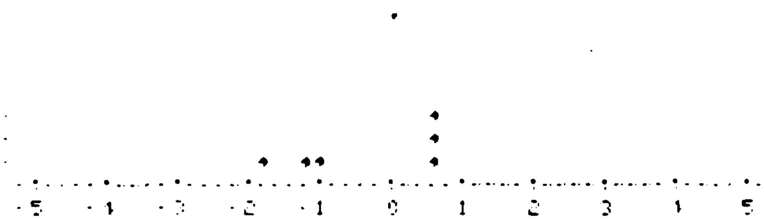


OTHER AEROSPACE

NO. OBS. = 6
MEAN = -11.8%
STD. DEV. = 11.4%
MIN. OBS. = -25%
MAX. OBS. = 0%

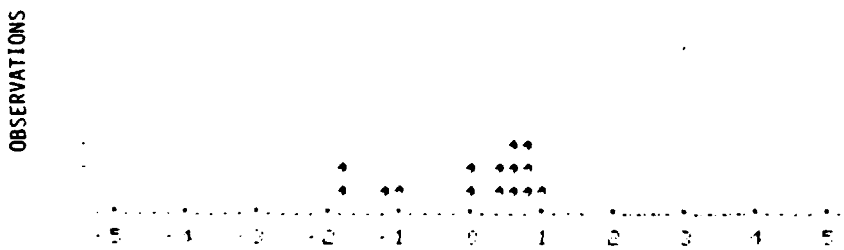
OTHER INDUSTRY

NO. OBS. = 6
MEAN = -36.7%
STD. DEV. = 29.9%
MIN. OBS. = -75%
MAX. OBS. = -10%



ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = -75%
MAX. OBS. = 0%

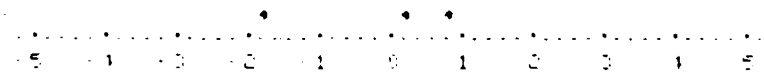


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = -25.7%   STD. DEV. = 26.8%

Q27 - PERCENT CHANGE IN SELECTING TOOLING FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

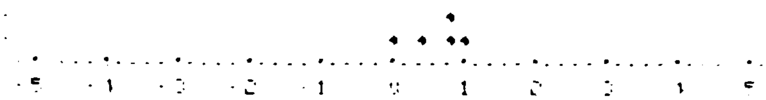
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = -31.7%
STD. DEV. = 38.2%
MIN. OBS. = -75%
MAX. OBS. = - 3%



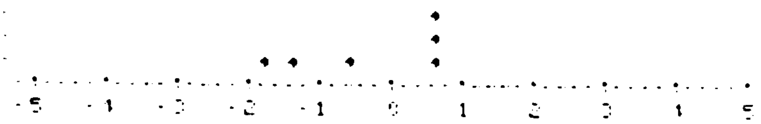
OTHER AEROSPACE

NO. OBS. = 5
MEAN = - 9.2%
STD. DEV. = 10.5%
MIN. OBS. = -25%
MAX. OBS. = 0%



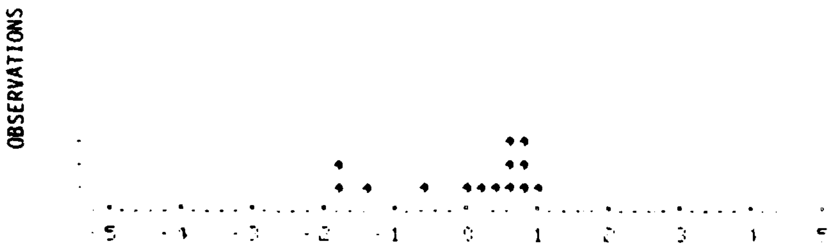
OTHER INDUSTRY

NO. OBS. = 6
MEAN = -34.2%
STD. DEV. = 28.7%
MIN. OBS. = -75%
MAX. OBS. = -10%



ALL RESPONSES

NO. OBS. = 14
MIN. OBS. = -75%
MAX. OBS. = 0%

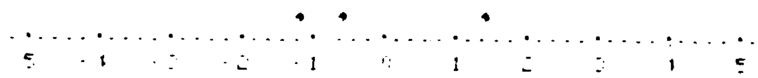


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = - 24.7% STD. DEV. = 26.8%

27 - PERCENT CHANGE IN DETERMINING PROCESSING PARAMETERS FOR CYLINDRICAL PARTS -- SYSTEM 2

ISSILE PRIMES & SUBS

0. OBS. = 3
IEAN = -31%
TD. DEV. = 24.8%
IIN. OBS. = -50.0%
IAX. OBS. = - 3.0%

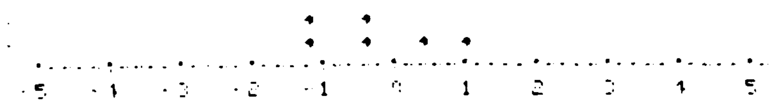


ITHER AEROSPACE

IO. OBS. = 6
IEAN = -19.5%
STD. DEV. = 18.2%
IIN. OBS. = -48%
IAX. OBS. = 0%

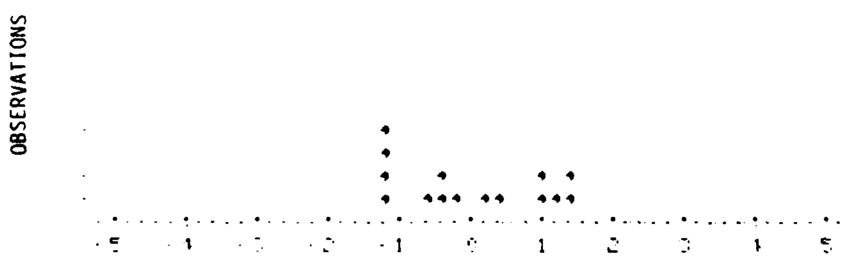
OTHER INDUSTRY

NO. OBS. = 6
MEAN = -33.3%
STD. DEV. = 16.0%
MIN. OBS. = -50%
MAX. OBS. = -10%



ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = -50%
MAX. OBS. = 0%

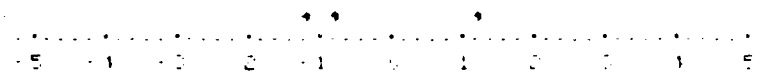


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = -27.3% STD. DEV. = 18.5%

PERCENT CHANGE IN DETERMINING PROCESSING PARAMETERS FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

E PRIMES & SUBS

S. = 3
= -31.7%
EV. = 23.6%
BS. = -50%
BS. = - 5%



AEROSPACE

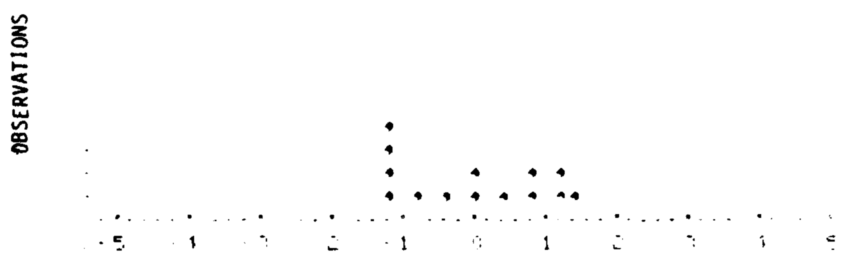
BS. = 5
= -17.6%
DEV. = 19.4%
OBS. = -48%
OBS. = 0%

INDUSTRY

BS. = 6
= -31.7%
DEV. = 16.3%
OBS. = -50%
OBS. = -10%

RESPONSES

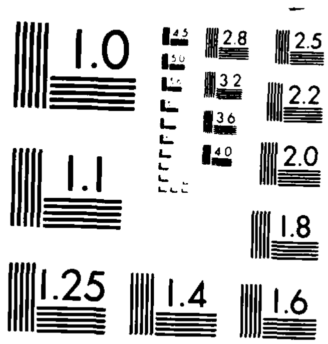
OBS. = 14
OBS. = -50%
OBS. = - 5%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -31.7% STD. DEV. = 16.3%

AD-A151 997 COMPUTERIZED PRODUCTION PROCESS PLANNING VOLUME 3 3/4
APPENDICES A B AND C TO BENEFIT ANALYSIS(U) IIT
RESEARCH INST CHICAGO IL H H SHU ET AL. NOV 76
UNCLASSIFIED DAAH01-76-C-1104 F/G 9/2 NL

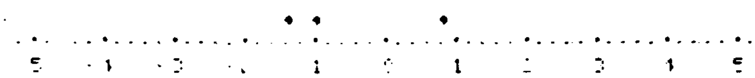


MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

Q27 - PERCENT CHANGE IN GENERATING TIME STANDARDS FOR CYLINDRICAL PARTS -- SYSTEM 2

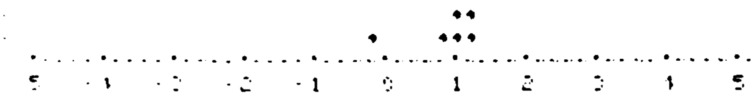
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = -31.7%
STD. DEV. = 23.6%
MIN. OBS. = -50%
MAX. OBS. = -5%



OTHER AEROSPACE

NO. OBS. = 6
MEAN = -6%
STD. DEV. = 9.5%
MIN. OBS. = -25%
MAX. OBS. = 0%

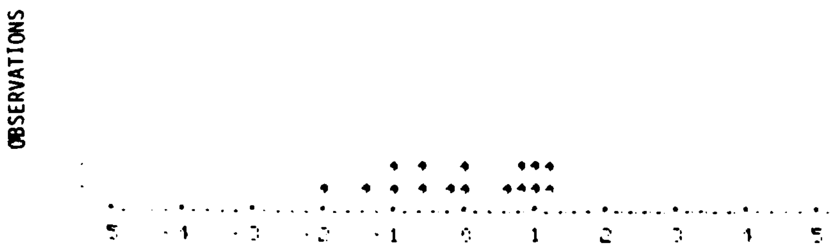


OTHER INDUSTRY

NO. OBS. = 7
MEAN = -31.4%
STD. DEV. = 16.5%
MIN. OBS. = -60%
MAX. OBS. = -10%

ALL RESPONSES

NO. OBS. = 16
MIN. OBS. = -60%
MAX. OBS. = 0%

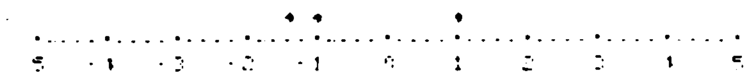


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = -21.9% STD. DEV. = 19.4%

Q27 - PERCENT CHANGE IN GENERATING TIME STANDARDS FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

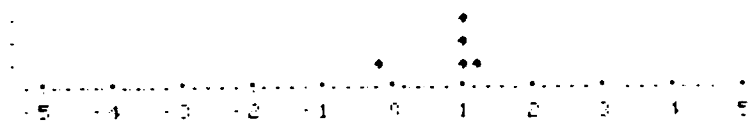
MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	31.7%
STD. DEV.	=	23.6%
MIN. OBS.	=	-50%
MAX. OBS.	=	-5%



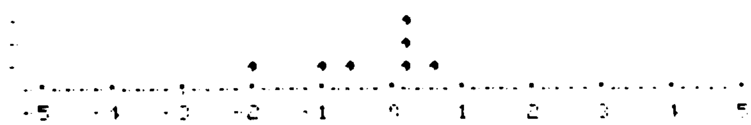
OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	-7.6%
STD. DEV.	=	9.9%
MIN. OBS.	=	-25%
MAX. OBS.	=	0%



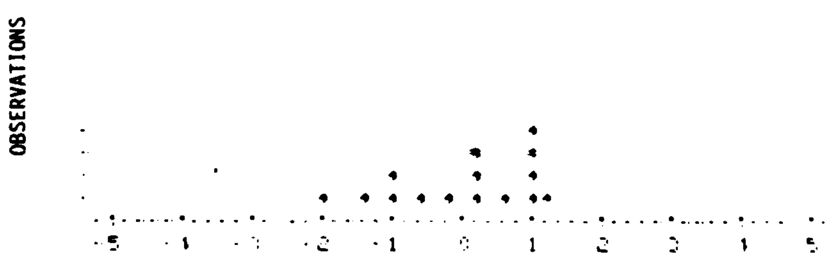
OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	-29.3%
STD. DEV.	=	16.9%
MIN. OBS.	=	-60%
MAX. OBS.	=	-10%



ALL RESPONSES

NO. OBS.	=	15
MIN. OBS.	=	-60%
MAX. OBS.	=	0%



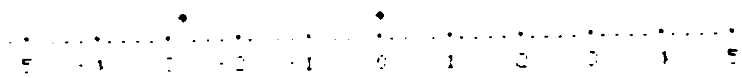
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -22.5% STD. DEV. = 18.7%

Q27 - PERCENT CHANGE IN PERFORMING TOLERANCE ANALYSES FOR CYLINDRICAL PARTS -- SYSTEM 2

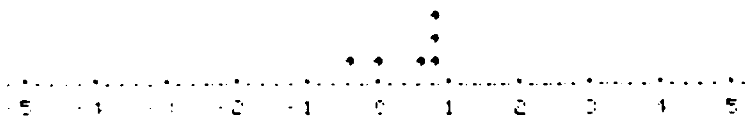
MISSILE PRIMES & SUBS

NO. OBS.	=	2
MEAN	=	-46%
STD. DEV.	=	41.0%
MIN. OBS.	=	-7.5%
MAX. OBS.	=	-17%



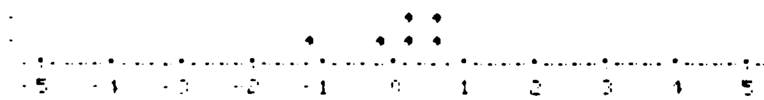
OTHER AEROSPACE

NO. OBS.	=	6
MEAN	=	-7.1%
STD. DEV.	=	11.0%
MIN. OBS.	=	-25%
MAX. OBS.	=	0%



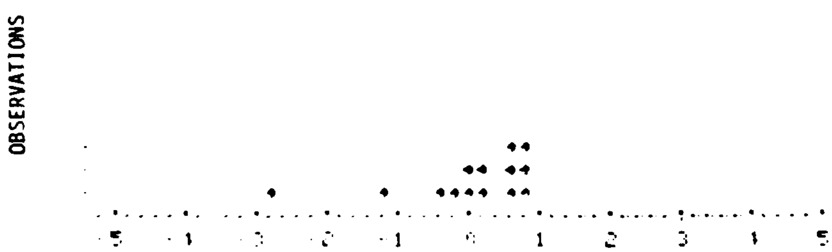
OTHER INDUSTRY

NO. OBS.	=	6
MEAN	=	-15%
STD. DEV.	=	13.4%
MIN. OBS.	=	-40%
MAX. OBS.	=	-5%



ALL RESPONSES

NO. OBS.	=	14
MIN. OBS.	=	-75%
MAX. OBS.	=	0%



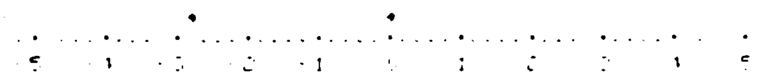
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -16.0% STD. DEV. = 20.4%

Q27 - PERCENT CHANGE IN PERFORMING TOLERANCE ANALYSES FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 2
MEAN = -46%
STD. DEV. = -41.0%
MIN. OBS. = -75
MAX. OBS. = -17%



OTHER AEROSPACE

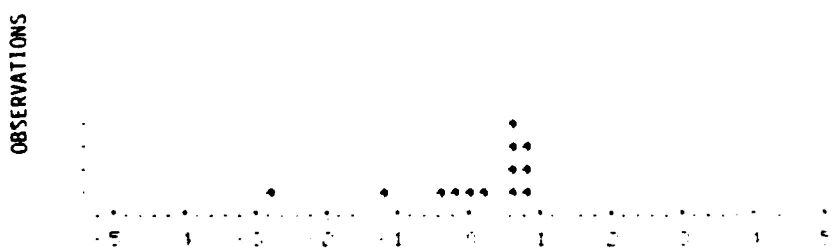
NO. OBS. = 5
MEAN = -6.1%
STD. DEV. = 10.8%
MIN. OBS. = -25%
MAX. OBS. = 0%

OTHER INDUSTRY

NO. OBS. = 6
MEAN = -14.2%
STD. DEV. = 13.9%
MIN. OBS. = -40%
MAX. OBS. = -5%

ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = -75%
MAX. OBS. = 0%

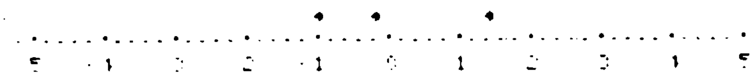


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = -16.0% STD. DEV. = 21.3%

Q27 - PERCENT CHANGE IN DOCUMENTATION COSTS FOR CYLINDRICAL PARTS -- SYSTEM 2

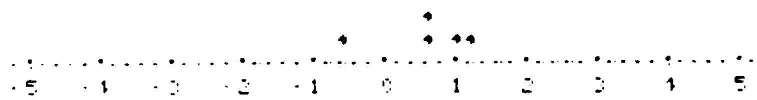
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = -25%
STD. DEV. = 27.8%
MIN. OBS. = -50%
MAX. OBS. = 5%



OTHER AEROSPACE

NO. OBS. = 5
MEAN = -14.5%
STD. DEV. = 15.8%
MIN. OBS. = -40%
MAX. OBS. = -0.5%

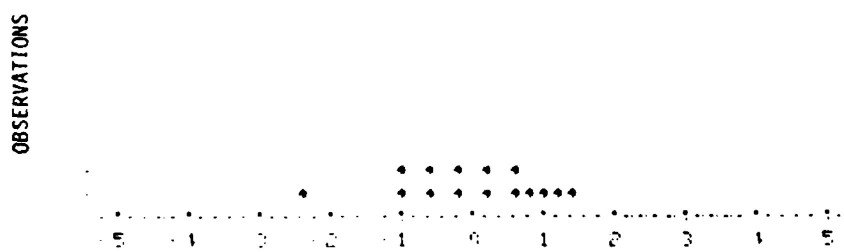


OTHER INDUSTRY

NO. OBS. = 7
MEAN = -35,7%
STD. DEV. = 23.7%
MIN. OBS. = -80%
MAX. OBS. = -10%

ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = -80%
MAX. OBS. = 5%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = -35.7 STD. DEV. = 23.7%

Q27 - PERCENT CHANGE IN DOCUMENTATION COSTS FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

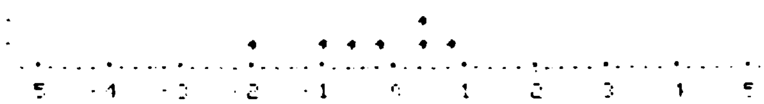
NO. OBS. = 3
MEAN = -28.3%
STD. DEV. = 29.3%
MIN. OBS. = -50%
MAX. OBS. = 5%

OTHER AEROSPACE

NO. OBS. = 4
MEAN = -14.4%
STD. DEV. = 18.3%
MIN. OBS. = -40%
MAX. OBS. = -0.5%

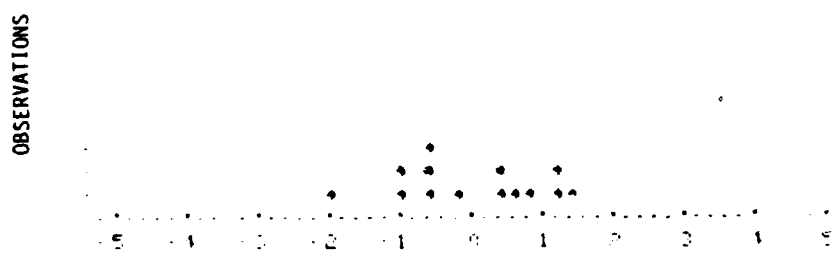
OTHER INDUSTRY

NO. OBS. = 7
MEAN = -34.3%
STD. DEV. = 20.7%
MIN. OBS. = -70%
MAX. OBS. = -10%



ALL RESPONSES

NO. OBS. = 14
MIN. OBS. = -70%
MAX. OBS. = 5%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -27.3% STD. DEV. = 22.0%

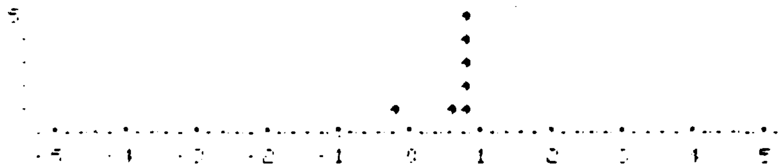
Q27 - PERCENT CHANGE IN MATERIAL FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = -4.3%
STD. DEV. = 1.2%
MIN. OBS. = -5%
MAX. OBS. = -3%

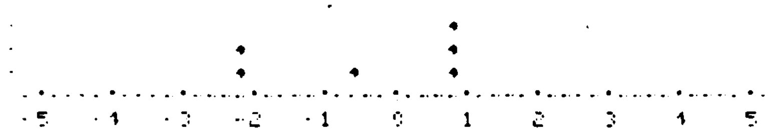
OTHER AEROSPACE

NO. OBS. = 7
MEAN = -0.5%
STD. DEV. = 1.1%
MIN. OBS. = -3%
MAX. OBS. = -0.5%



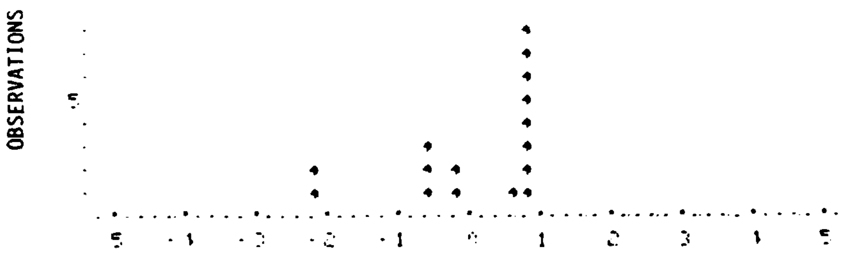
OTHER INDUSTRY

NO. OBS. = 6
MEAN = -4.2%
STD. DEV. = 4.9%
MIN. OBS. = -10%
MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 16
MIN. OBS. = -10%
MAX. OBS. = 0%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -2.6% STD. DEV. = 3.5%

Q27 - PERCENT CHANGE IN MATERIAL FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

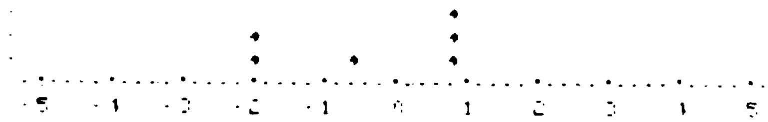
NO. OBS. = 3
MEAN = -4.3%
STD. DEV. = 1.2%
MIN. OBS. = -15%
MAX. OBS. = -5%

OTHER AEROSPACE

NO. OBS. = 6
MEAN = -.6%
STD. DEV. = 1.2%
MIN. OBS. = -3%
MAX. OBS. = 0%

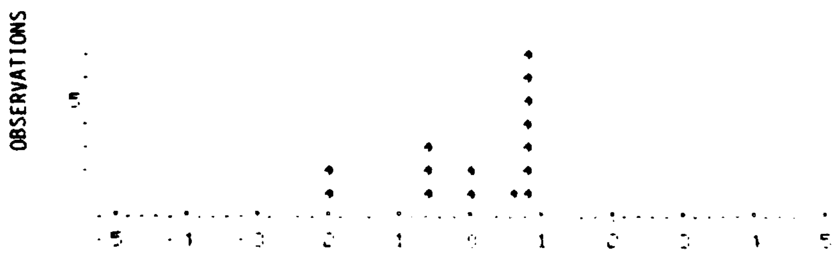
OTHER INDUSTRY

NO. OBS. = 6
MEAN = -4.2%
STD. DEV. = 4.9%
MIN. OBS. = -10%
MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = -15%
MAX. OBS. = 0%



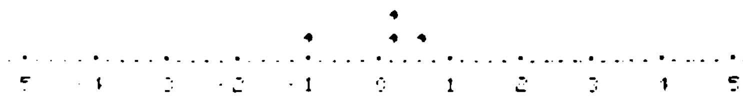
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -2.8%   STD. DEV. = 3.6%

Q27 - PERCENT CHANGE IN DIRECT LABOR FOR CYLINDRICAL PARTS -- SYSTEM 2

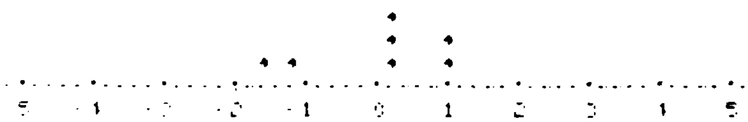
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	-7%
STD. DEV.	=	5.6%
MIN. OBS.	=	-15%
MAX. OBS.	=	-2%



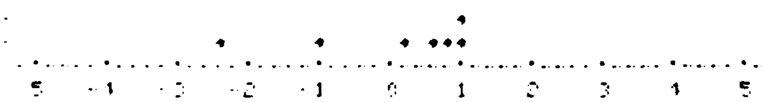
OTHER AEROSPACE

NO. OBS.	=	7
MEAN	=	-7.6%
STD. DEV.	=	7.9%
MIN. OBS.	=	-20%
MAX. OBS.	=	0%



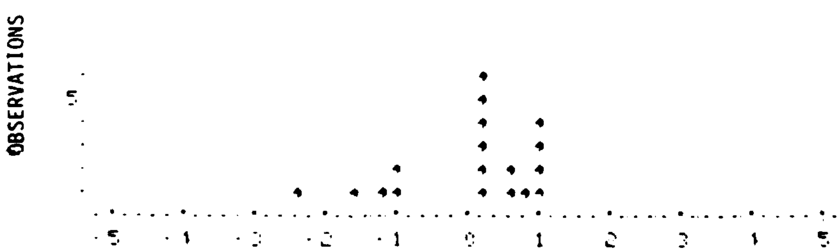
OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	-7.0%
STD. DEV.	=	9.6%
MIN. OBS.	=	-25%
MAX. OBS.	=	0%



ALL RESPONSES

NO. OBS.	=	18
MIN. OBS.	=	-25%
MAX. OBS.	=	0%



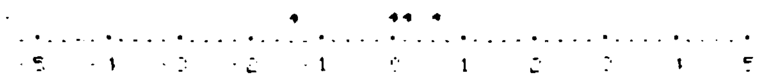
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -7.2% STD. DEV. = 7.7%

Q27 - PERCENT CHANGE IN DIRECT LABOR FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

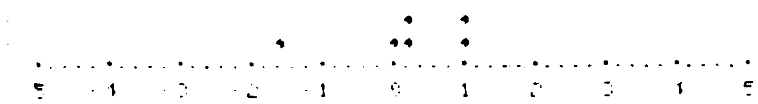
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	-7%
STD. DEV.	=	5.6%
MIN. OBS.	=	-15%
MAX. OBS.	=	-2%



OTHER AEROSPACE

NO. OBS.	=	6
MEAN	=	-5.5%
STD. DEV.	=	6.3%
MIN. OBS.	=	-17%
MAX. OBS.	=	0%

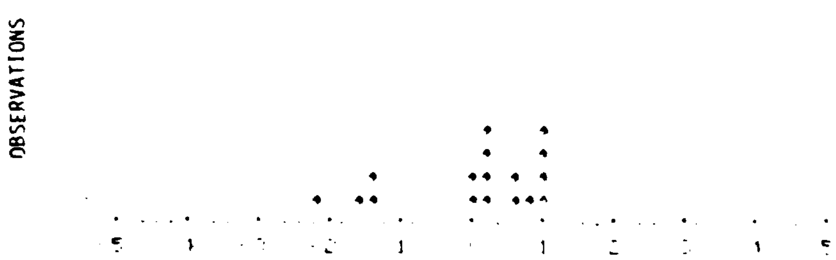


OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	-6.1%
STD. DEV.	=	8.1%
MIN. OBS.	=	-25%
MAX. OBS.	=	0%

ALL RESPONSES

NO. OBS.	=	17
MIN. OBS.	=	-25%
MAX. OBS.	=	0%



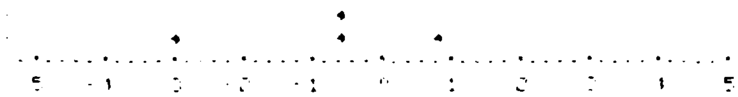
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -6.1% STD. DEV = 6.5%

Q27 - PERCENT CHANGE IN SCRAP AND REWORK FOR CYLINDRICAL PARTS -- SYSTEM 2

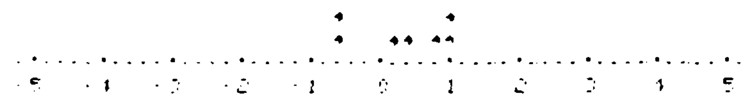
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -11.5%
STD. DEV. = 9.9%
MIN. OBS. = -25%
MAX. OBS. = -1%



OTHER AEROSPACE

NO. OBS. = 7
MEAN = -4.1%
STD. DEV. = 4.4%
MIN. OBS. = -10%
MAX. OBS. = 0%

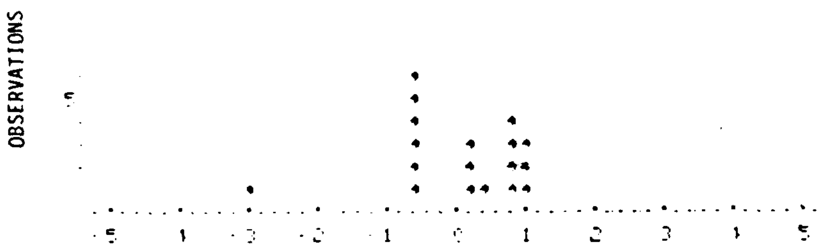


OTHER INDUSTRY

NO. OBS. = 7
MEAN = -4.6%
STD. DEV. = 4.2%
MIN. OBS. = -10%
MAX. OBS. = -5%

ALL RESPONSES

NO. OBS. = 18
MIN. OBS. = -25%
MAX. OBS. = 0%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -5.9% STD. DEV. = 6.3%

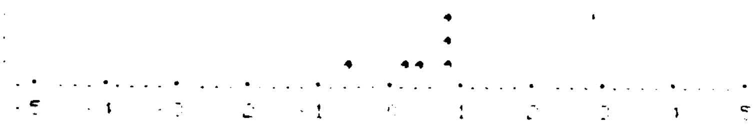
27 - PERCENT CHANGE IN SCRAP AND REWORK FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	-11.5%
STD. DEV.	=	9.9%
MIN. OBS.	=	-25%
MAX. OBS.	=	-1%

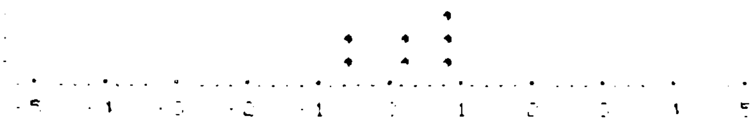
OTHER AEROSPACE

NO. OBS.	=	6
MEAN	=	-3.2%
STD. DEV.	=	3.8%
MIN. OBS.	=	-10%
MAX. OBS.	=	0%



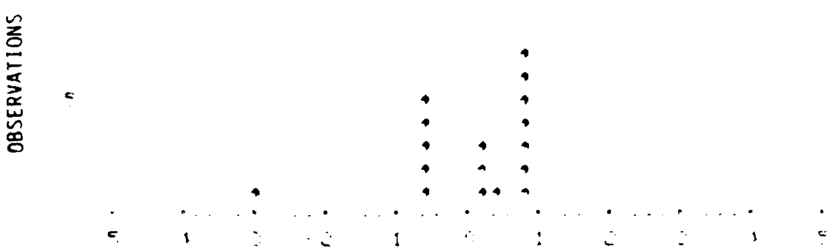
OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	-4.6%
STD. DEV.	=	4.2%
MIN. OBS.	=	-10%
MAX. OBS.	=	0%



ALL RESPONSES

NO. OBS.	=	17
MIN. OBS.	=	-25%
MAX. OBS.	=	0%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -5.7% STD. DEV. = 6.4%

Q29 - MONTHS TO ACQUIRE HARDWARE -- SYSTEM 2 FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 3.0 mo.
STD. DEV. = 0.8 mo.
MIN. OBS. = 2 mo.
MAX. OBS. = 4 mo.

OTHER AEROSPACE

NO. OBS. = 2
MEAN = 7.3 mo.
STD. DEV. = 1.8 mo.
MIN. OBS. = 6 mo.
MAX. OBS. = 8.5 mo.

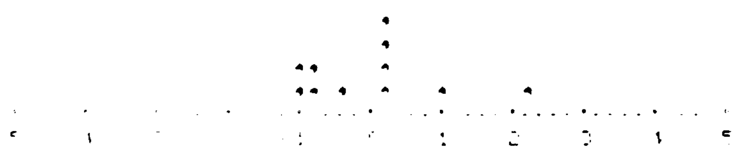
OTHER INDUSTRY

NO. OBS. = 5
MEAN = 6.4 mo.
STD. DEV. = 3.6 mo.
MIN. OBS. = 2 mo.
MAX. OBS. = 12 mo.

OBSERVATIONS

ALL RESPONSES

NO. OBS = 11
MIN. OBS. = 2 mo
MAX. OBS. = 12 mo



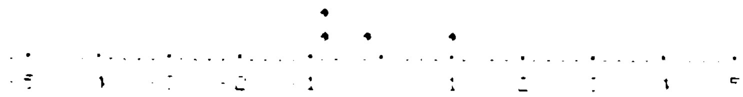
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 5.3 mo STD. DEV. = 3.0 mo.

Q29 - COST TO TEST SYSTEM -- SYSTEM 2 FOR NON-CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	$14.6K
STD. DEV.	=	$14.4K
MIN. OBS.	=	$ 4K
MAX. OBS.	=	$ 35K

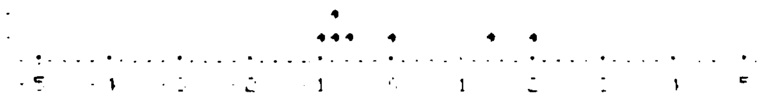


OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	$20.5K
STD. DEV.	=	$17.5K
MIN. OBS.	=	$ 6K
MAX. OBS.	=	$ 50K

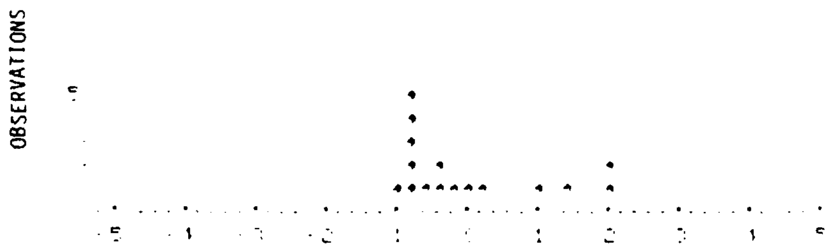
OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	$19.1K
STD. DEV.	=	$18.8K
MIN. OBS.	=	$ 2K
MAX. OBS.	=	$ 50K



ALL RESPONSES

NO. OBS.	=	16
MIN. OBS.	=	$ 2K
MAX. OBS.	=	$ 50K



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $18.4K STD. DEV. = $16.4K

Q29 - COST TO TEST SYSTEM -- SYSTEM 2 FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

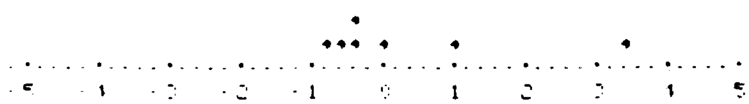
NO. OBS.	=	4
MEAN	=	$10.7K
STD. DEV.	=	$10.2K
MIN. OBS.	=	$ 2K
MAX. OBS.	=	$ 25K

OTHER AEROSPACE

NO. OBS.	=	6
MEAN	=	$13.3K
STD. DEV.	=	$ 6.4K
MIN. OBS.	=	$ 4K
MAX. OBS.	=	$ 20K

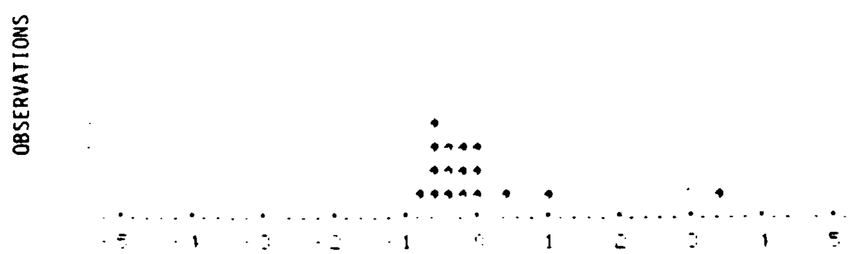
OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	$25.4K
STD. DEV.	=	$35.6K
MIN. OBS.	=	$ 0.3K
MAX. OBS.	=	$ 100K



ALL RESPONSES

NO. OBS.	=	17
MIN. OBS.	=	$0.3K
MAX. OBS.	=	$100K



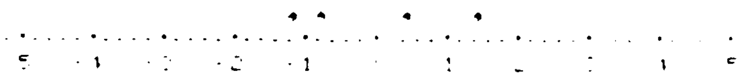
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $17.7K STD. DEV. = $23.5K

Q29 - COST TO TRAIN PERSONNEL -- SYSTEM 2 FOR NON-CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	$10.0K
STD. DEV.	=	$ 7.9K
MIN. OBS.	=	$ 2.5K
MAX. OBS.	=	$ 20K



OTHER AEROSPACE

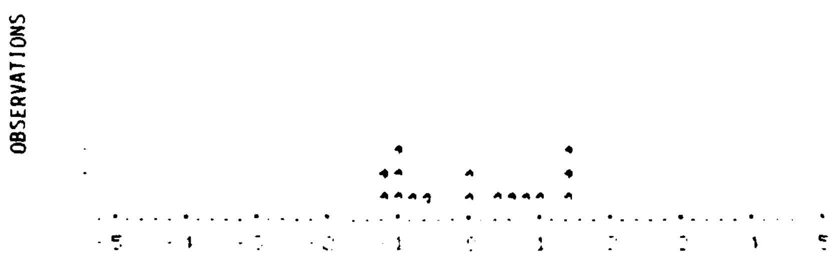
NO. OBS.	=	5
MEAN	=	$10.7K
STD. DEV.	=	$ 6.0K
MIN. OBS.	=	$ 4K
MAX. OBS.	=	$17.5K

OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	$10.4K
STD. DEV.	=	$ 8.0K
MIN. OBS.	=	$ 2K
MAX. OBS.	=	$ 20K

ALL RESPONSES

NO. OBS.	=	16
MIN. OBS.	=	$ 2K
MAX. OBS.	=	$ 20K



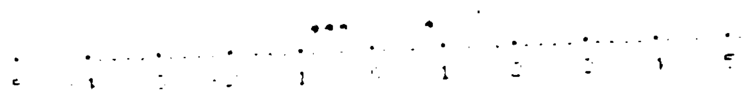
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $10.4K STD. DEV. = $6.9K

Q29 - COST TO TRAIN PERSONNEL -- SYSTEM 2 FOR CYLINDRICAL PARTS

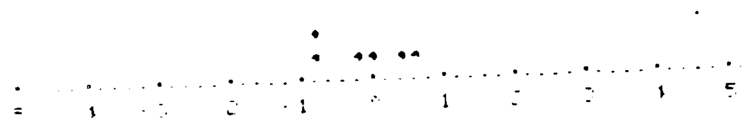
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = $ 8.5K
STD. DEV. = $ 7.9K
MIN. OBS. = $ 2.5K
MAX. OBS. = $ 20K



OTHER AEROSPACE

NO. OBS. = 6
MEAN = $ 9.6K
STD. DEV. = $ 6.5K
MIN. OBS. = $ 2.0K
MAX. OBS. = $17.5K

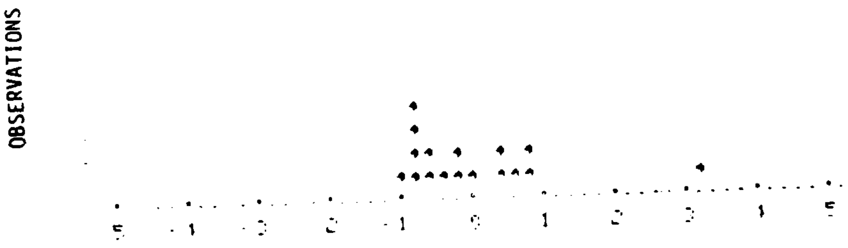


OTHER INDUSTRY

NO. OBS. = 7
MEAN = $14.3K
STD. DEV. = $17.3K
MIN. OBS. = $ 0.2K
MAX. OBS. = $ 50K

ALL RESPONSES

NO. OBS. = 17
MIN. OBS. = $ 0.2K
MAX. OBS. = $ 50K



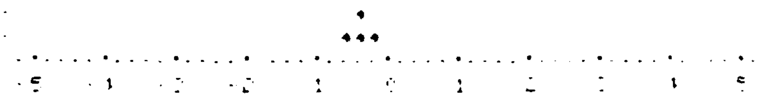
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $11.25K STD. DEV = $12.0K

Q29 - COST TO ESTABLISH INITIAL DATA FILES -- SYSTEM 2 FOR NON-CYLINDRICAL PARTS

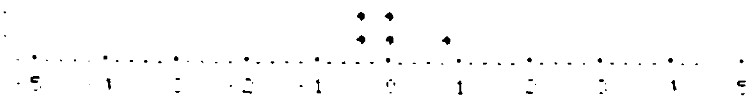
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	\$35.8K
STD. DEV.	=	\$15.9K
MIN. OBS.	=	\$ 13K
MAX. OBS.	=	\$ 50K



OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	\$87.8K
STD. DEV.	=	\$69.7K
MIN. OBS.	=	\$ 27K
MAX. OBS.	=	\$ 200K

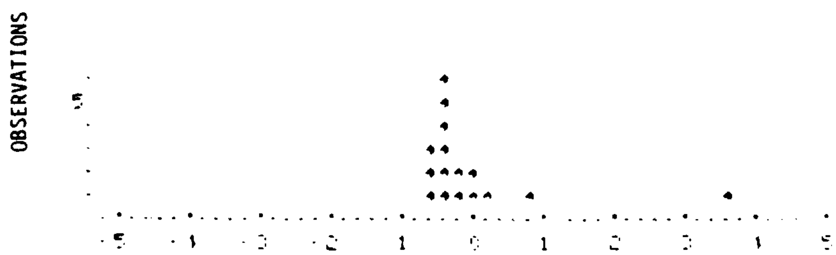


OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	\$118.5K
STD. DEV.	=	\$216.0K
MIN. OBS.	=	\$ 5K
MAX. OBS.	=	\$ 600K

ALL RESPONSES

NO. OBS.	=	16
MIN. OBS.	=	\$5K
MAX. OBS.	=	\$600K



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$88.2K STD. DEV. = \$145.5K

Q29 - COST TO ESTABLISH INITIAL DATA FILES -- SYSTEM 2 FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

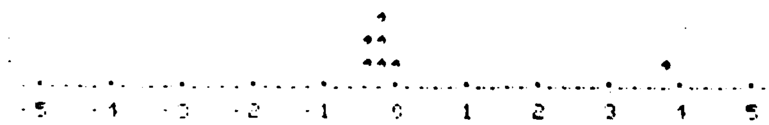
NO. OBS.	=	4
MEAN	=	$33.1K
STD. DEV.	=	$18.7K
MIN. OBS.	=	$ 6.5K
MAX. OBS.	=	$ 50K

OTHER AEROSPACE

NO. OBS.	=	6
MEAN	=	$43.7K
STD. DEV.	=	$36.9K
MIN. OBS.	=	$12.0K
MAX. OBS.	=	$ 100K

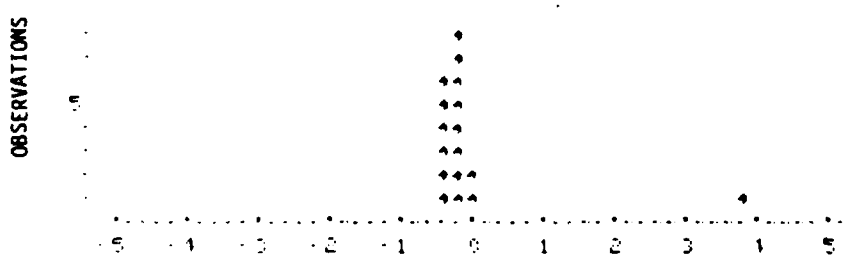
OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	$231.5K
STD. DEV.	=	$516.9K
MIN. OBS.	=	$ 0.5K
MAX. OBS.	=	$1400K



ALL RESPONSES

NO. OBS.	=	17
MIN. OBS.	=	$0.5K
MAX. OBS.	=	$1400K



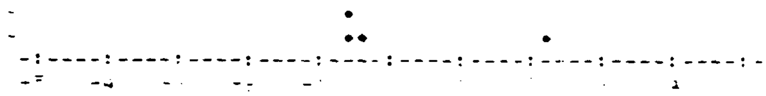
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $118.5K STD. DEV. = $332.0K

Q29 - COST TO ACQUIRE HARDWARE -- SYSTEM 2 FOR NON-CYLINDRICAL PARTS

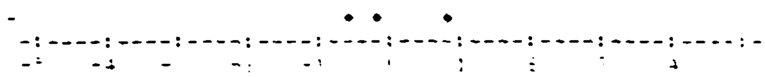
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = $101.8K
STD. DEV. = $165.7K
MIN. OBS. = $12.0K
MAX. OBS. = $350.0K



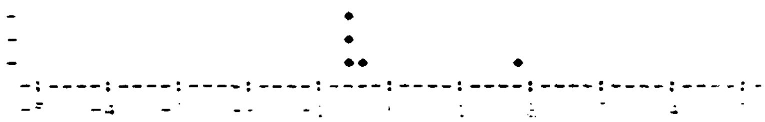
OTHER AEROSPACE

NO. OBS. = 3
MEAN =
STD. DEV. =
MIN. OBS. = $ 27K
MAX. OBS. = $ 200K



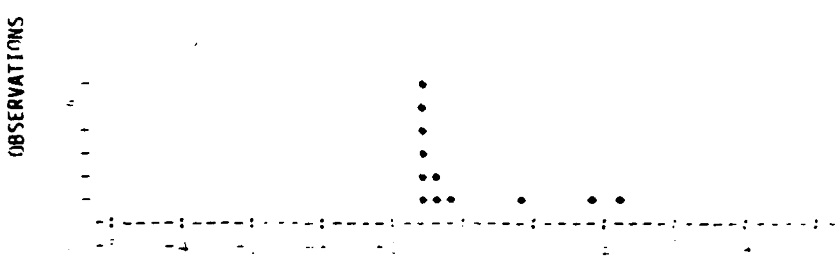
OTHER INDUSTRY

NO. OBS. = 5
MEAN = $76.8K
STD. DEV. = $125.9K
MIN. OBS. = $ 9.0K
MAX. OBS. = $ 300K



ALL RESPONSES

NO. OBS. = 12
MIN. OBS. = $ 9.0K
MAX. OBS. = $ 300K

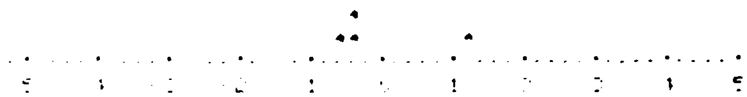


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $91K STD. DEV. = $122K

Q29 - COST TO ACQUIRE HARDWARE -- SYSTEM 2 FOR NON-CYLINDRICAL PARTS

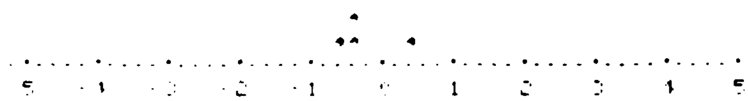
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	$99.9K
STD. DEV.	=	$167.0K
MIN. OBS.	=	$ 7.5K
MAX. OBS.	=	$ 350K



OTHER AEROSPACE

NO. OBS.	=	4
MEAN	=	$56.2K
STD. DEV.	=	$97.9K
MIN. OBS.	=	$12.9K
MAX. OBS.	=	$ 200K

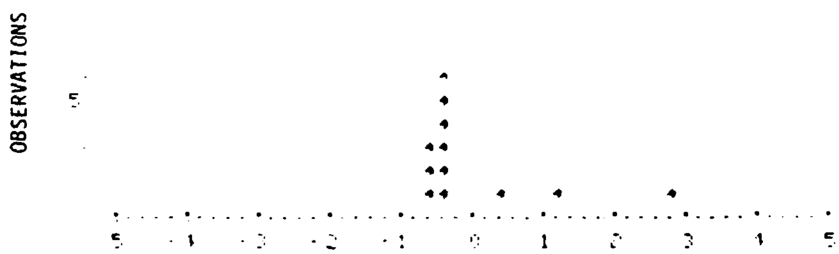


OTHER INDUSTRY

NO. OBS.	=	4
MEAN	=	$193.8K
STD. DEV.	=	$338.0K
MIN. OBS.	=	$ 10K
MAX. OBS.	=	$ 700K

ALL RESPONSES

NO. OBS.	=	12
MIN. OBS.	=	$ 7.5K
MAX. OBS.	=	$ 700K



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $116.6K STD. DEV. = $212.1K

Q28 - IMPACT OF SYSTEM 2 ON OTHER AREAS (RANKED ON A SCALE OF -2 to +2, WHERE -2 = SIGNIFICANTLY NEGATIVE IMPACT, 0 - NO CHANGE, +2 = SIGNIFICANT IMPROVEMENT)

AREAS IMPACTED	MISSILE PRIME AND SUBS.					OTHER AEROSPACE					OTHER INDUSTRY					TOTAL				
	-2	-1	0	+1	+2	-2	-1	0	+1	+2	-2	-1	0	+1	+2	-2	-1	0	+1	+2
PRODUCTION LEADTIME				1	3			1	6					5	4			1	12	7
PROCESS PLANNING LEADTIME				1	3				5	2				3	6				9	11
MACHINE UTILIZATION			2	1	1			3	4				3	2	4			8	7	5
PRODUCT QUALITY			2	2				4	3				5	4				11	9	
DIRECT LABOR UTILIZATION			2	2				4	3				5	4				11	9	
UNIFORMITY OF PROCESS PLANS					4				3	4				3	6				6	14
COST ESTIMATING PROCEDURES				2	1				6	1			1	3	5			1	11	7
MAKE/BUY DECISIONS				2				1	6				1	3	5			1	6	11
PRODUCT STANDARDIZATION				2	1				5	2			3	3	3			3	10	6
CRITICAL LABOR SKILLS			1	2				4	2	1		1	7		1		1	12	4	2
MATERIAL STANDARDIZATION				2	1			4	2	1			5	3	1			9	7	3
PRODUCIBILITY OF PARTS			1	3				3	3	1			4	5				8	11	1
PLANT LAYOUT			3	1				4	2	1			2	6	1			9	9	2
MATERIAL HANDLING			1	2				5	1	1			1	6	2			7	9	3
PRODUCTION SCHEDULING			2		1			5	2					4	5			7	6	6
CAPACITY PLANNING			1	3				4	3					4	5			5	10	5

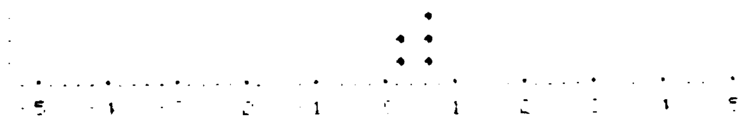
Q27 - PERCENT CHANGE IN WORK IN PROCESS INVENTORY FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS.	=	2
MEAN	=	2.5%
STD. DEV.	=	3.5%
MIN. OBS.	=	0%
MAX. OBS.	=	5%

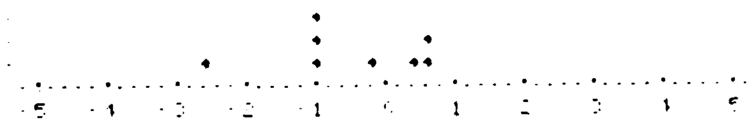
OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	-.8%
STD. DEV.	=	1.1%
MIN. OBS.	=	-2%
MAX. OBS.	=	0%



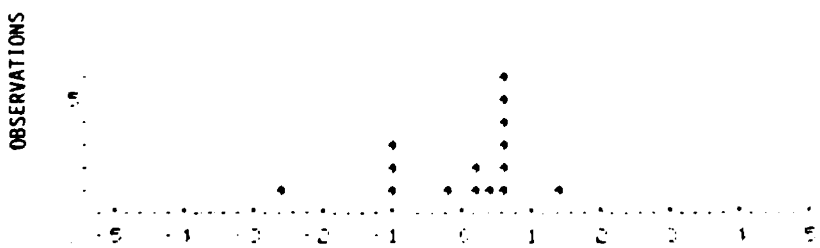
OTHER INDUSTRY

NO. OBS.	=	8
MEAN	=	-6.9%
STD. DEV.	=	7%
MIN. OBS.	=	-20%
MAX. OBS.	=	0%



ALL RESPONSES

NO. OBS.	=	15
MIN. OBS.	=	-20%
MAX. OBS.	=	5%



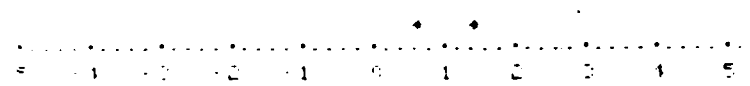
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -3.6% STD. DEV. = 6.3%

Q27 - PERCENT CHANGE IN WORK IN PROCESS INVENTORY FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 2
MEAN = 2.5%
STD. DEV. = 3.5%
MIN. OBS. = 0%
MAX. OBS. = 5%



OTHER AEROSPACE

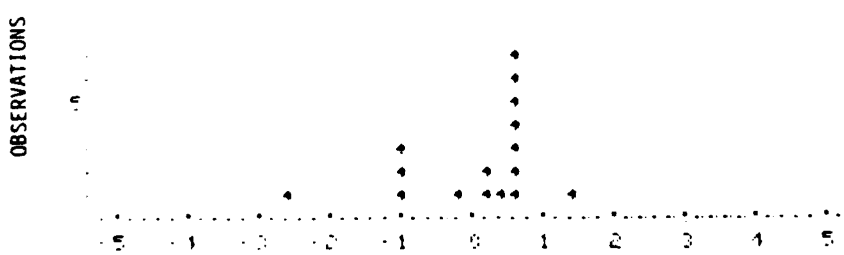
NO. OBS. = 6
MEAN = -.7%
STD. DEV. = 1.0%
MIN. OBS. = -2%
MAX. OBS. = 0%

OTHER INDUSTRY

NO. OBS. = 8
MEAN = -6.9%
STD. DEV. = 7%
MIN. OBS. = -20%
MAX. OBS. = 0%

ALL RESPONSES

NO. OBS. = 16
MIN. OBS. = -20%
MAX. OBS. = 5%



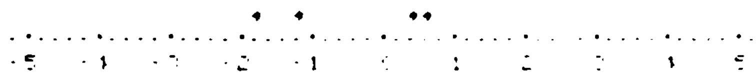
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -3.5% STD. DEV. = 6.2%

Q27 - PERCENT CHANGE IN TOOLING FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

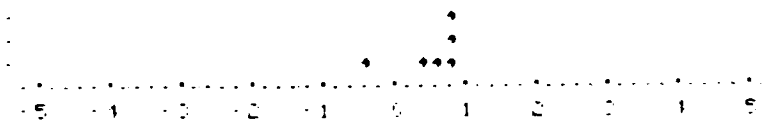
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -10%
STD. DEV. = 8.9%
MIN. OBS. = -20%
MAX. OBS. = -2%



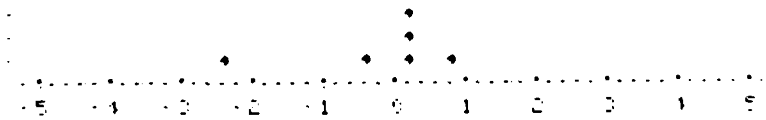
OTHER AEROSPACE

NO. OBS. = 6
MEAN = -2.7%
STD. DEV. = 3.8%
MIN. OBS. = -10%
MAX. OBS. = 0%



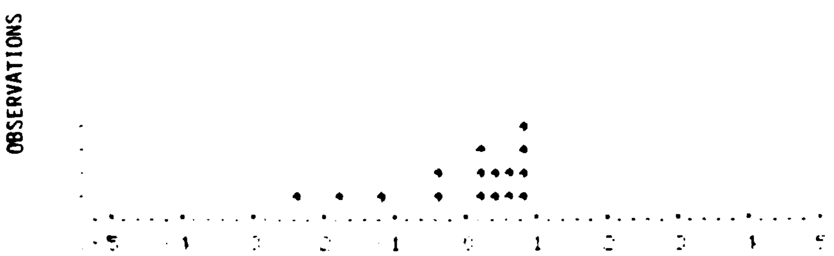
OTHER INDUSTRY

NO. OBS. = 6
MEAN = -8.3%
STD. DEV. = 8.8%
MIN. OBS. = -25%
MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 16
MIN. OBS. = -25%
MAX. OBS. = 0%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = -6.6% STD. DEV. = 7.5%

Q27 - PERCENT CHANGE IN TOOLING FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

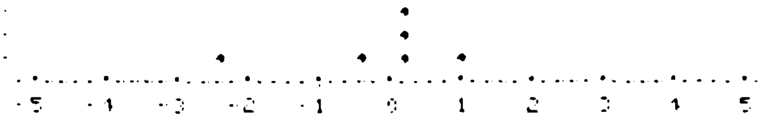
NO. OBS.	=	4
MEAN	=	-10%
STD. DEV.	=	8.9%
MIN. OBS.	=	-20%
MAX. OBS.	=	-2%

OTHER AEROSPACE

NO. OBS.	=	7
MEAN	=	-3.7%
STD. DEV.	=	4.4%
MIN. OBS.	=	-10%
MAX. OBS.	=	0%

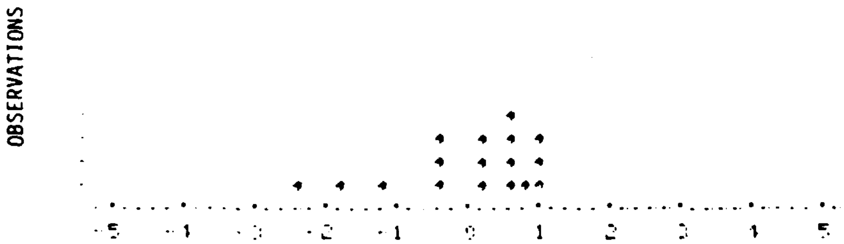
OTHER INDUSTRY

NO. OBS.	=	6
MEAN	=	-8.3%
STD. DEV.	=	9.8%
MIN. OBS.	=	-25%
MAX. OBS.	=	0%



ALL RESPONSES

NO. OBS.	=	17
MIN. OBS.	=	-25%
MAX. OBS.	=	0%



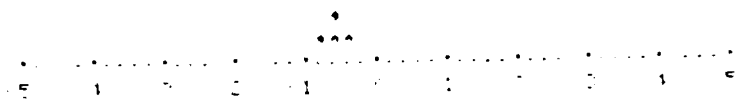
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -6.8% STD. DEV. = 7.3%

Q29 - MONTHS TO ACQUIRE HARDWARE -- SYSTEM 2 FOR NON-CYLINDRICAL PARTS

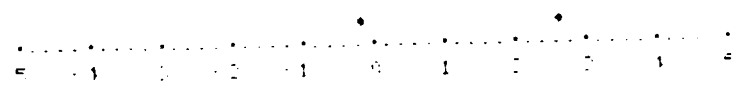
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 3.0 mo.
STD. DEV. = 0.8 mo.
MIN. OBS. = 2 mo.
MAX. OBS. = 4 mo.



OTHER AEROSPACE

NO. OBS. = 2
MEAN = 15.0 mo.
STD. DEV. = 12.7 mo.
MIN. OBS. = 6 mo.
MAX. OBS. = 24 mo.



OTHER INDUSTRY

NO. OBS. = 4
MEAN = 6.5 mo.
STD. DEV. = 4.1 mo.
MIN. OBS. = 2 mo.
MAX. OBS. = 12 mo.

OBSERVATIONS

ALL RESPONSES

NO. OBS. = 10
MIN. OBS. = 2 mo.
MAX. OBS. = 24 mo.

STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 6.8 mo. STD. DEV. = 6.8 mo.

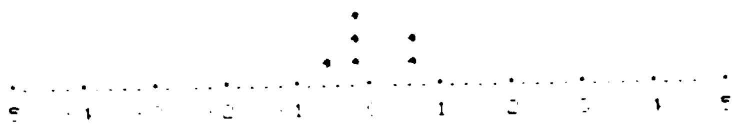
Q29 - MONTHS TO ESTABLISH DATA FILES FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 5.6 mo.
STD. DEV. = 2.1 mo.
MIN. OBS. = 3 mo.
MAX. OBS. = 8 mo.

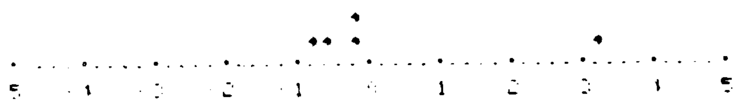
OTHER AEROSPACE

NO. OBS. = 6
MEAN = 7.6 mo.
STD. DEV. = 3.6 mo.
MIN. OBS. = 3.5 mo.
MAX. OBS. = 12 mo.



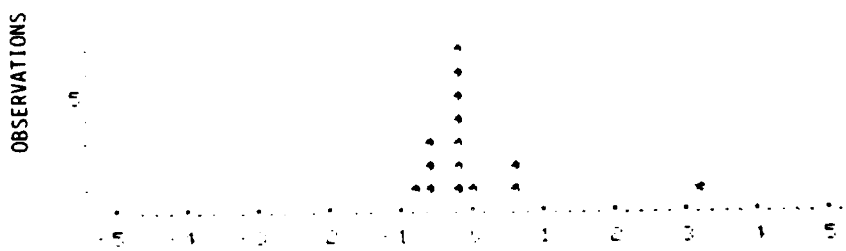
OTHER INDUSTRY

NO. OBS. = 5
MEAN = 9.4 mo.
STD. DEV. = 11.7 mo.
MIN. OBS. = 2 mo.
MAX. OBS. = 30 mo.



ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = 2 mo.
MAX. OBS. = 30 mo.



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 7.7 mo. STD. DEV. = 6.8 mo.

Q29 - MONTHS TO ESTABLISH DATA FILES FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

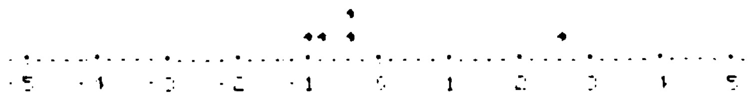
NO. OBS.	=	4
MEAN	=	6.8 mo.
STD. DEV.	=	3.0 mo.
MIN. OBS.	=	3 mo.
MAX. OBS.	=	10 mo.

OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	11.6 mo.
STD. DEV.	=	7.8 mo.
MIN. OBS.	=	4 mo.
MAX. OBS.	=	24 mo.

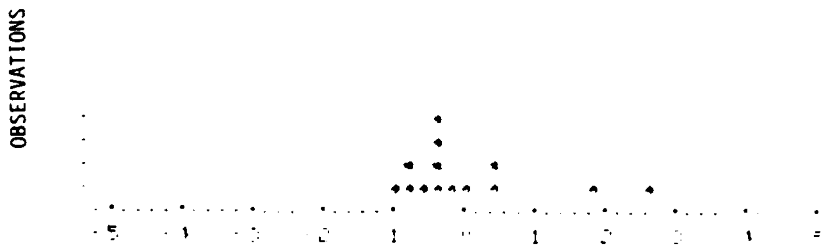
OTHER INDUSTRY

NO. OBS.	=	5
MEAN	=	9.4 mo.
STD. DEV.	=	11.7 mo.
MIN. OBS.	=	2 mo.
MAX. OBS.	=	30 mo.



ALL RESPONSES

NO. OBS.	=	14
MIN. OBS.	=	2 mo.
MAX. OBS.	=	30 mo.



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 9.4 mo. STD. DEV. = 8.2 mo.

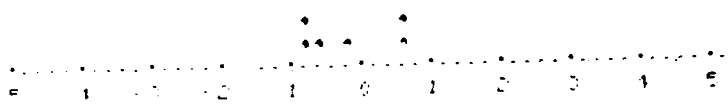
Q29 - MONTHS TO TRAIN PERSONNEL IN USE OF SYSTEM 2 FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 4.1 mo.
STD. DEV. = 5.3 mo.
MIN. OBS. = 1 mo.
MAX. OBS. = 12 mo.

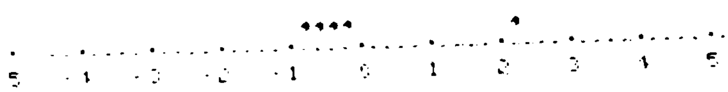
OTHER AEROSPACE

NO. OBS. = 6
MEAN = 2.8 mo.
STD. DEV. = 2.6 mo.
MIN. OBS. = 0.5 mo.
MAX. OBS. = 6 mo.



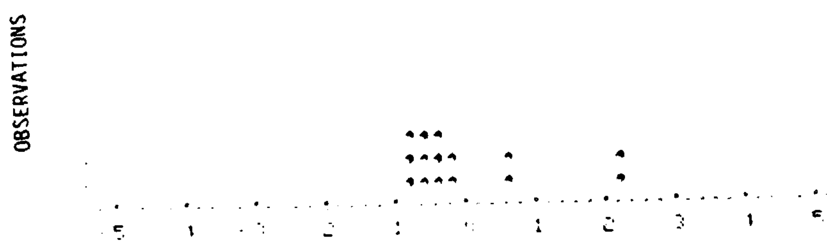
OTHER INDUSTRY

NO. OBS. = 5
MEAN = 3.7 mo.
STD. DEV. = 4.8 mo.
MIN. OBS. = 0.25 mo.
MAX. OBS. = 12 mo.



ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = 0.25 mo.
MAX. OBS. = 12 mo



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 3.5 mo. STD. DEV. = 3.9 mo.

Q29 - MONTHS TO TRAIN PERSONNEL IN USE OF SYSTEM 2 FOR NON-CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

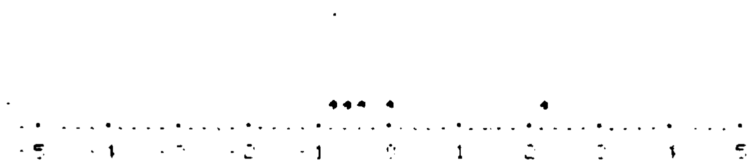
NO. OBS. = 4
MEAN = 4.1 mo.
STD. DEV. = 5.3 mo.
MIN. OBS. = 1 mo.
MAX. OBS. = 12 mo.

OTHER AEROSPACE

NO. OBS. = 5
MEAN = 2.3 mo.
STD. DEV. = 2.3 mo.
MIN. OBS. = 0.5 mo.
MAX. OBS. = 6 mo.

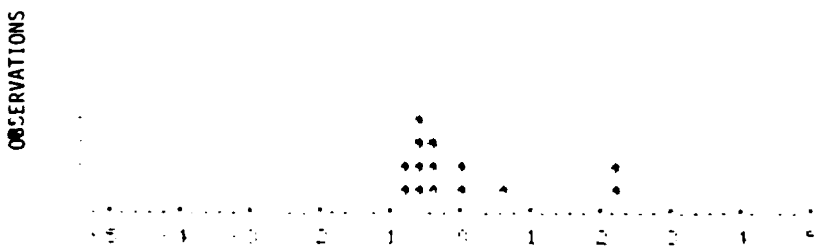
OTHER INDUSTRY

NO. OBS. = 5
MEAN = 3.7 mo.
STD. DEV. = 4.8 mo.
MIN. OBS. = 0.3 mo.
MAX. OBS. = 12 mo.



ALL RESPONSES

NO. OBS. = 14
MIN. OBS. = 0.3 mo.
MAX. OBS. = 12 mo.



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 3.3 mo. STD. DEV. = 4.0 mo.

Q29 - MONTHS TO TEST SYSTEM FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

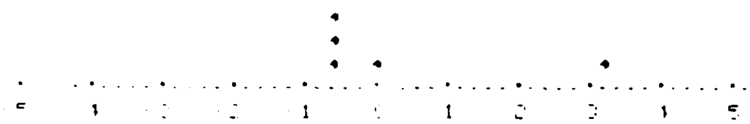
NO. OBS. = 4
MEAN = 2.9 mo.
STD. DEV. = 2.3 mo.
MIN. OBS. = 1 mo.
MAX. OBS. = 6 mo.

OTHER AEROSPACE

NO. OBS. = 6
MEAN = 6.5 mo.
STD. DEV. = 4.5 mo.
MIN. OBS. = 2 mo.
MAX. OBS. = 12 mo.

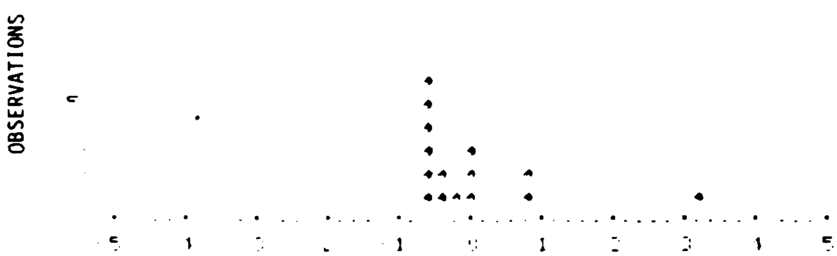
OTHER INDUSTRY

NO. OBS. = 5
MEAN = 8.4 mo.
STD. DEV. = 12.2 mo.
MIN. OBS. = 2 mo.
MAX. OBS. = 30 mo.



ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = 1 mo.
MAX. OBS. = 30 mo.



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 6.2 mo. STD. DEV. = 7.5 mo.

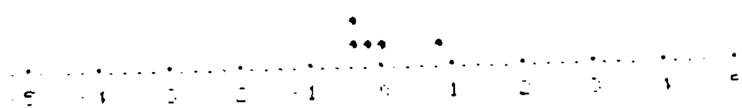
Q29 - MONTHS TO TEST SYSTEM FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 2.9 mo.
STD. DEV. = 2.3 mo.
MIN. OBS. = 1 mo.
MAX. OBS. = 6 mo.

OTHER AEROSPACE

NO. OBS. = 5
MEAN = 5.6 mo.
STD. DEV. = 3.8 mo.
MIN. OBS. = 3 mo.
MAX. OBS. = 12 mo.

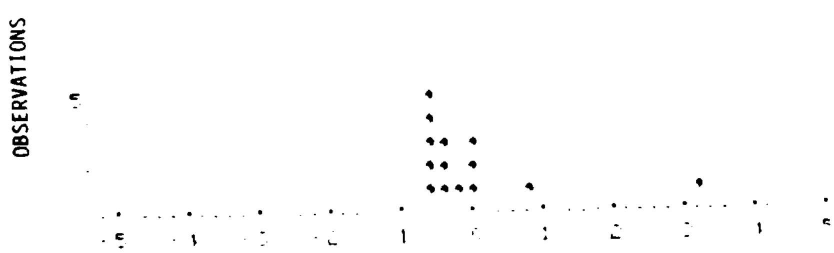


OTHER INDUSTRY

NO. OBS. = 5
MEAN = 8.4 mo.
STD. DEV. = 12.2 mo.
MIN. OBS. = 2 mo.
MAX. OBS. = 30 mo.

ALL RESPONSES

NO. OBS. = 14
MIN. OBS. = 1 mo.
MAX. OBS. = 30 mo.



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 5.8 mo. STD. DEV. = 7.6 mo.

Q29 - ANNUAL COMPUTER CHARGES AND MAINTENANCE COST FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

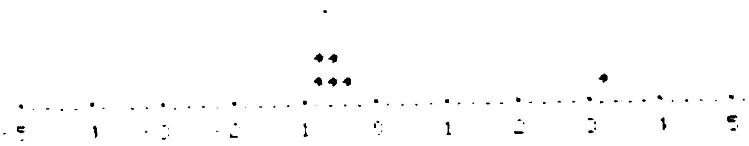
NO. OBS. = 4
MEAN = $ 38.2K
STD. DEV. = $ 17.6K
MIN. OBS. = $ 24.0K
MAX. OBS. = $ 65.6K

OTHER AEROSPACE

NO. OBS. = 6
MEAN = $ 23.8K
STD. DEV. = $ 14.2K
MIN. OBS. = $ 12.0K
MAX. OBS. = $ 50.0K

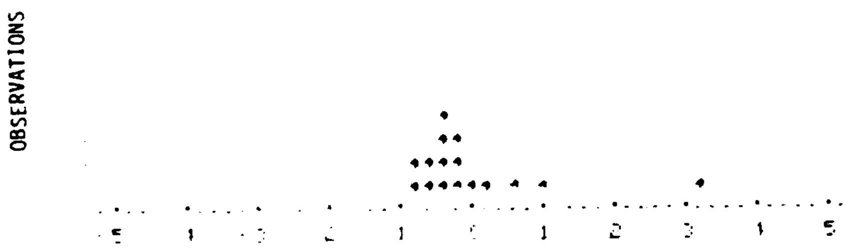
OTHER INDUSTRY

NO. OBS. = 6
MEAN = $ 28.8K
STD. DEV. = $ 54.7K
MIN. OBS. = $ 0.7K
MAX. OBS. = $140.0K



ALL RESPONSES

NO. OBS. = 16
MIN. OBS. = $ 0.7K
MAX. OBS. = $140.0K

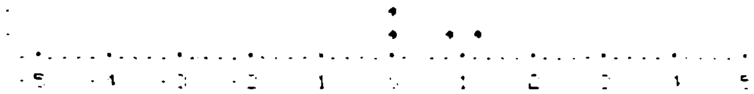


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $ 28.9K STD. DEV. = $ 34.1K

Q29 - ANNUAL COMPUTER CHARGES AND MAINTENANCE COST FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = $50.0K
STD. DEV. = $17.1K
MIN. OBS. = $35.0K
MAX. OBS. = $68.8K

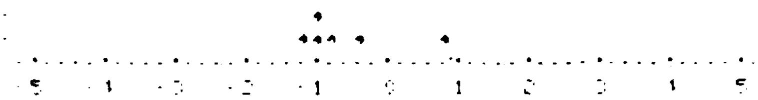


OTHER AEROSPACE

NO. OBS. = 5
MEAN = $43.8K
STD. DEV. = $33.6K
MIN. OBS. = $20.0K
MAX. OBS. = $100.0K

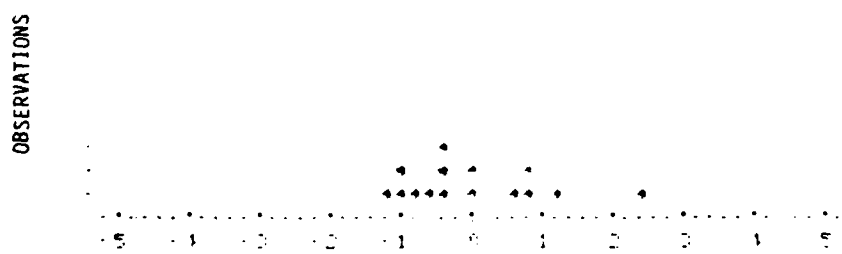
OTHER INDUSTRY

NO. OBS. = 6
MEAN = $19.3K
STD. DEV. = $21.4K
MIN. OBS. = $ 0.7K
MAX. OBS. = $60.0K



ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = $ 0.7K
MAX. OBS. = $100.0K



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $ 35.6K STD. DEV. = $ 27.8K

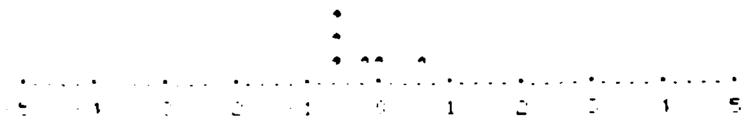
Q29 - ANNUAL COST TO UPDATE DATA FILES FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	$11.3K
STD. DEV.	=	$ 7.6K
MIN. OBS.	=	$ 1.0K
MAX. OBS.	=	$18.0K

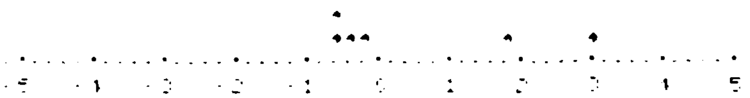
OTHER AEROSPACE

NO. OBS.	=	6
MEAN	=	$18.3K
STD. DEV.	=	$18.0K
MIN. OBS.	=	$ 4.0K
MAX. OBS.	=	$50.0K



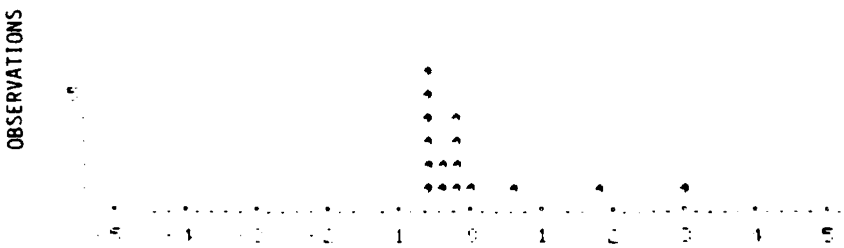
OTHER INDUSTRY

NO. OBS.	=	6
MEAN	=	$45.6K
STD. DEV.	=	$58.7K
MIN. OBS.	=	$ 0.1K
MAX. OBS.	=	$140.0K



ALL RESPONSES

NO. OBS.	=	16
MIN. OBS.	=	$ 0.1K
MAX. OBS.	=	$140.0K



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $ 26.8K STD. DEV. =$ 38.9K

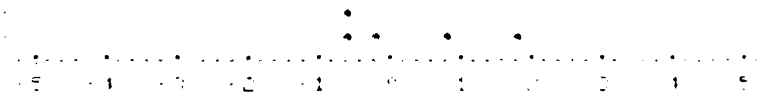
Q29 - ANNUAL COST TO UPDATE DATA FILES FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = $13.8K
STD. DEV. = $ 9.8K
MIN. OBS. = $ 2.0K
MAX. OBS. = $24.0K

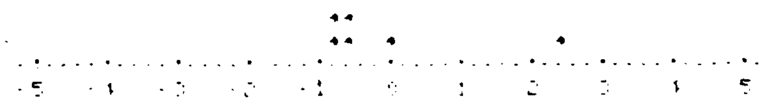
OTHER AEROSPACE

NO. OBS. = 5
MEAN = $21.1K
STD. DEV. = $19.2K
MIN. OBS. = $ 6.0K
MAX. OBS. = $50.0K



OTHER INDUSTRY

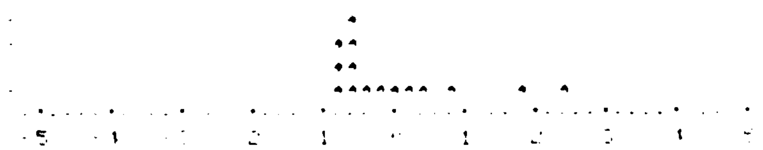
NO. OBS. = 6
MEAN = $16.1K
STD. DEV. = $ 2.2K
MIN. OBS. = $ 1.9K
MAX. OBS. = $60.0K



ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = $ 1.9K
MAX. OBS. = $60.0K

OBSERVATIONS



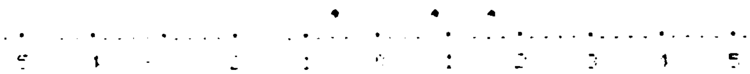
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $ 17.1K STD. DEV. = $ 17.7K

31 - PERCENT CHANGE IN PROCESS PLANNING FOR CYLINDRICAL PARTS -- SYSTEM 3

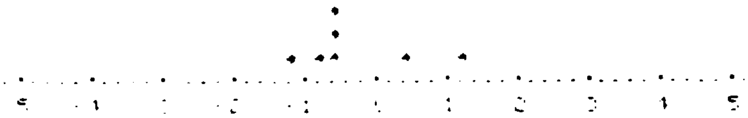
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = -45%
STD. DEV. = 23%
MIN. OBS. = -70%
MAX. OBS. = -25%



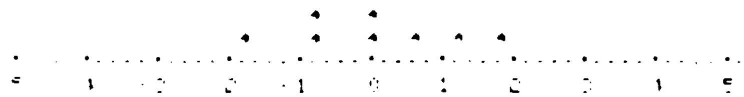
OTHER AEROSPACE

NO. OBS. = 7
MEAN = -65%
STD. DEV. = 17%
MIN. OBS. = -84%
MAX. OBS. = -35%



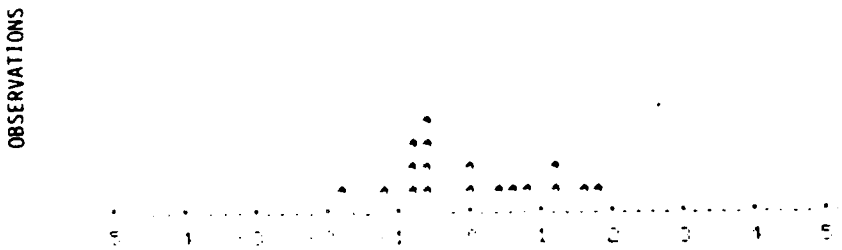
OTHER INDUSTRY

NO. OBS. = 8
MEAN = -58%
STD. DEV. = 24%
MIN. OBS. = -95%
MAX. OBS. = -20%



ALL RESPONSES

NO. OBS. = 18
MIN. OBS. = -95%
MAX. OBS. = -20%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = - 58% STD. DEV. = 21%

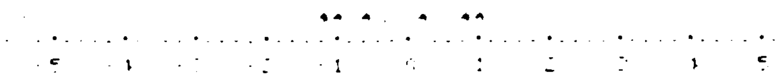
Q31 - PERCENT CHANGE IN PROCESS PLANNING FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = -45%
STD. DEV. = 33%
MIN. OBS. = -70%
MAX. OBS. = -25%

OTHER AEROSPACE

NO. OBS. = 6
MEAN = -60%
STD. DEV. = 21%
MIN. OBS. = -84%
MAX. OBS. = -35%

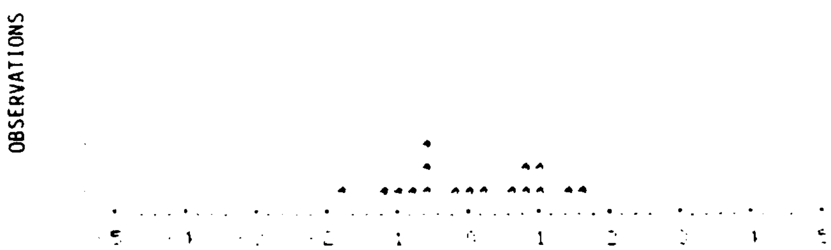


OTHER INDUSTRY

NO. OBS. = 8
MEAN = -57%
STD. DEV. = 24%
MIN. OBS. = -95%
MAX. OBS. = -20%

ALL RESPONSES

NO. OBS. = 17
MIN. OBS. = -95%
MAX. OBS. = -20%



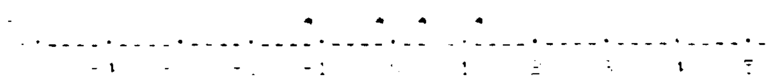
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = - 56% STD. DEV. = 22%

31 - PERCENT CHANGE IN DETERMINING OPERATION SEQUENCES FOR CYLINDRICAL PARTS -- SYSTEM 3

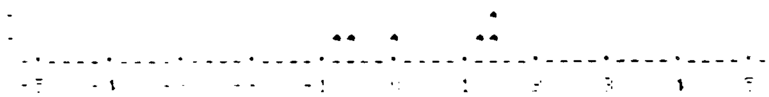
ISSILE PRIMES & SUBS

O. OBS. = 4
EAN = -49%
TD. DEV. = 33%
IN. OBS. = -90%
AX. OBS = -10%



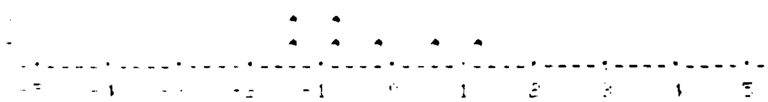
THER AEROSPACE

O. OBS. = 6
EAN = -36%
TD. DEV. = 35%
IN. OBS. = -80%
AX OBS = - 4%



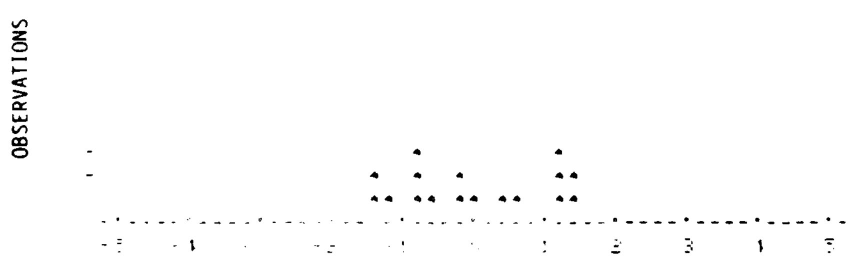
THER INDUSTRY

O. OBS. = 7
EAN = -64%
TD. DEV. = 32%
IN. OBS. = -95%
AX. OBS. = -10%



L RESPONSES

O. OBS = 17
IN. OBS. = -95%
AX. OBS. = - 4%



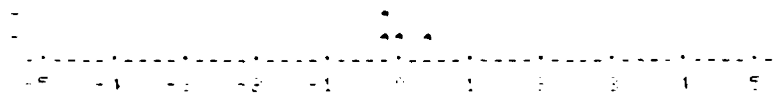
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = - 51% STD. DEV. = 34%

Q31 - PERCENT REDUCTION IN MATERIAL COST FOR CYCLINDRICAL PARTS -- SYSTEM 3

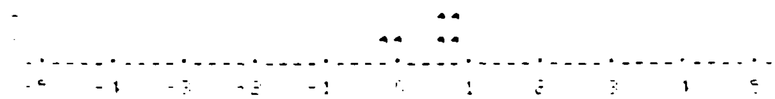
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = - 4.0%
STD. DEV. = 1.4%
MIN. OBS. = - 5%
MAX. OBS. = - 2%



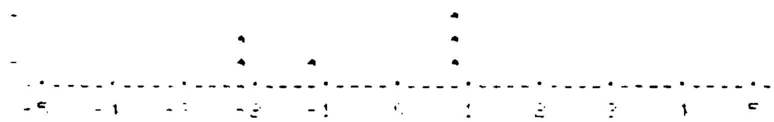
OTHER AEROSPACE

NO. OBS. = 6
MEAN = - 1.8%
STD. DEV. = 2.1%
MIN. OBS. = - 5%
MAX. OBS. = 0%



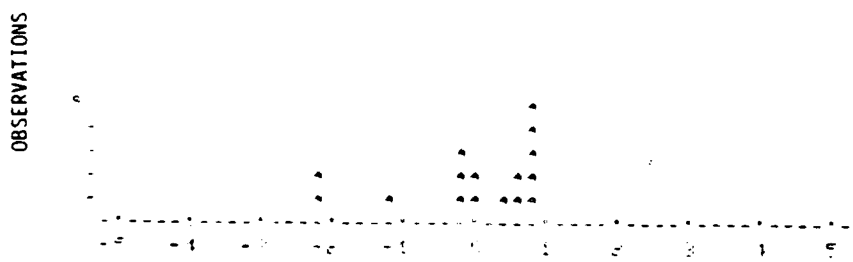
OTHER INDUSTRY

NO. OBS. = 6
MEAN = - 6.7%
STD. DEV. = 7.5%
MIN. OBS. = -15%
MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 16
MIN. OBS. = -15%
MAX. OBS. = 0%

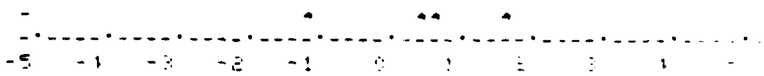


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = - 4.2%   STD. DEV. = 5.0%

Q31 - PERCENT REDUCTION IN DOCUMENTATION COSTS FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

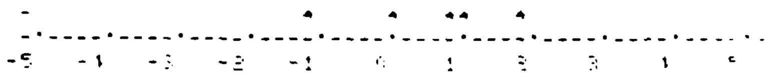
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -45%
STD. DEV. = 35%
MIN. OBS. = -90%
MAX. OBS. = - 5%



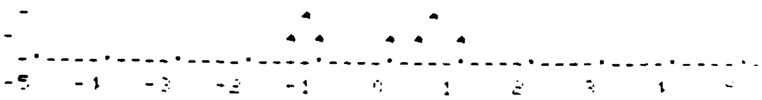
OTHER AEROSPACE

NO. OBS. = 5
MEAN = -40%
STD. DEV. = 34%
MIN. OBS. = -90%
MAX. OBS. = - 2%



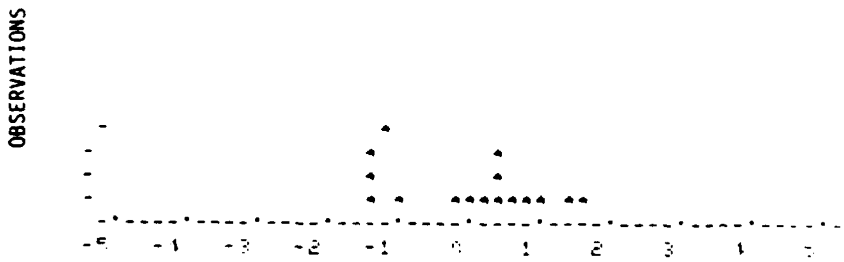
OTHER INDUSTRY

NO. OBS. = 7
MEAN = -59%
STD. DEV. = 29%
MIN. OBS. = -90%
MAX. OBS. = -20%



ALL RESPONSES

NO. OBS. = 16
MIN. OBS. = -90%
MAX. OBS. = - 2%

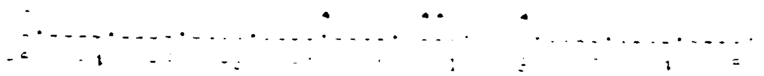


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = - 50% STD. DEV. = 31%

Q31 - PERCENT REDUCTION IN DOCUMENTATION COSTS FOR CYLINDRICAL PARTS -- SYSTEM 3

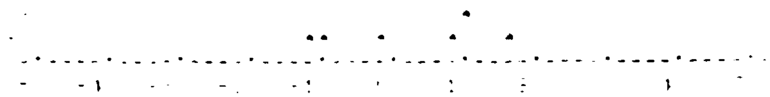
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -45%
STD. DEV. = 35%
MIN. OBS. = -90%
MAX. OBS. = - 5%



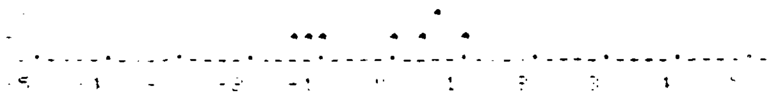
OTHER AEROSPACE

NO. OBS. = 6
MEAN = -48%
STD. DEV. = 35%
MIN. OBS. = -90%
MAX. OBS. = - 2%



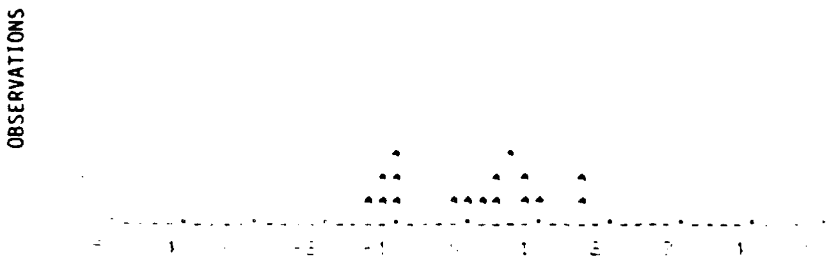
OTHER INDUSTRY

NO. OBS. = 7
MEAN = -59%
STD. DEV. = 29%
MIN. OBS. = -95%
MAX. OBS. = -20%



ALL RESPONSES

NO. OBS. = 17
MIN. OBS. = -95%
MAX. OBS. = - 2%

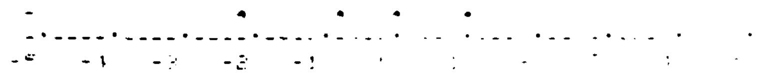


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = - 52% STD. DEV. = 31%

Q31 - PERCENT REDUCTION IN PERFORMING TOLERANCE ANALYSES FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

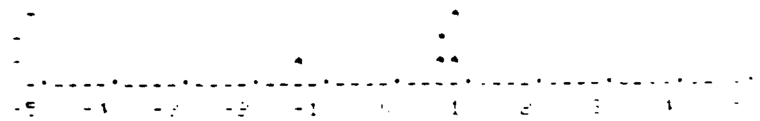
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	-36%
STD. DEV.	=	30%
MIN. OBS.	=	-75%
MAX. OBS.	=	- 3%



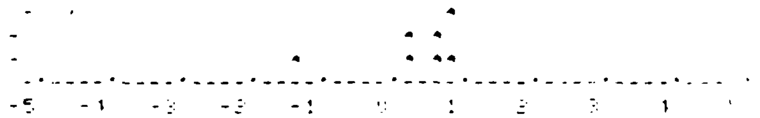
OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	-13%
STD. DEV.	=	21%
MIN. OBS.	=	-50%
MAX. OBS.	=	- 2%



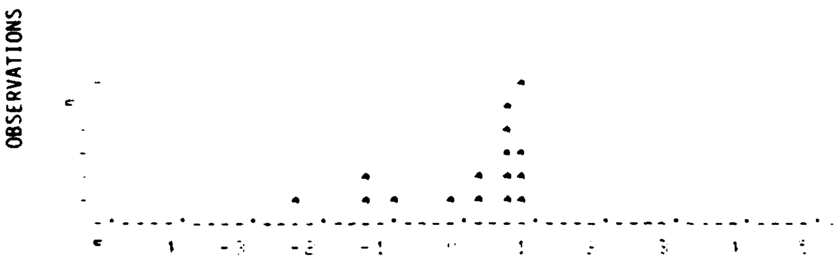
OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	-14%
STD. DEV.	=	17%
MIN. OBS.	=	-50%
MAX. OBS.	=	0%



ALL RESPONSES

NO. OBS.	=	16
MIN. OBS.	=	-75%
MAX. OBS.	=	0%



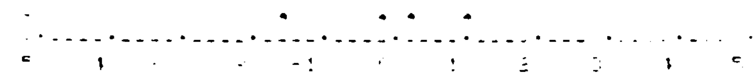
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = - 19% STD. DEV. = 22%

Q31 - PERCENT REDUCTION IN PERFORMING TOLERANCE ANALYSES FOR CYLINDRICAL PARTS -- SYSTEM 3

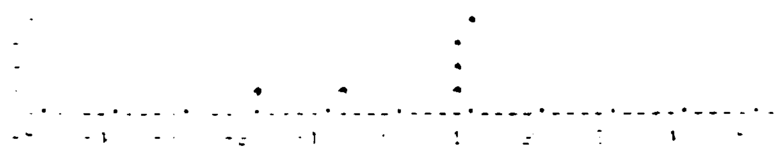
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	-36%
STD. DEV.	=	30%
MIN. OBS.	=	-75%
MAX. OBS.	=	- 3%



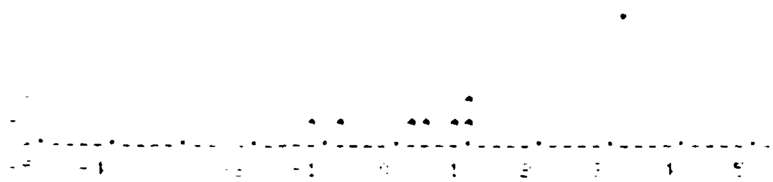
OTHER AEROSPACE

NO. OBS.	=	6
MEAN	=	-25%
STD. DEV.	=	35%
MIN. OBS.	=	-95%
MAX. OBS.	=	- 2%



OTHER INDUSTRY

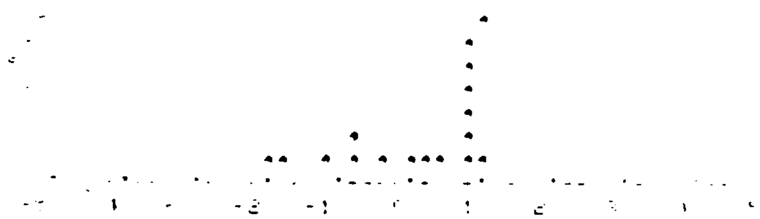
NO. OBS.	=	7
MEAN	=	-22%
STD. DEV.	=	23%
MIN. OBS.	=	-50%
MAX. OBS.	=	0%



ALL RESPONSES

NO. OBS.	=	17
MIN. OBS.	=	-95%
MAX. OBS.	=	0%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = - 26% STD. DEV. = 28%

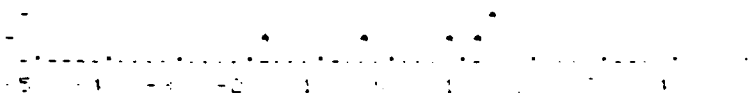
Q31 - PERCENT REDUCTION IN PREPARING TIME STANDARDS FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	-38%
STD. DEV.	=	23%
MIN. OBS.	=	-55%
MAX. OBS.	=	- 5%

OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	-34%
STD. DEV.	=	36%
MIN. OBS.	=	-90%
MAX. OBS.	=	- 5%

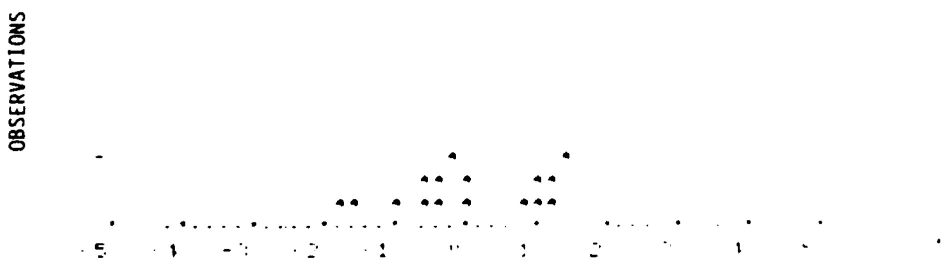


OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	-49%
STD. DEV.	=	28%
MIN. OBS.	=	-85%
MAX. OBS.	=	-10%

ALL RESPONSES

NO. OBS.	=	16
MIN. OBS.	=	-90%
MAX. OBS.	=	- 5%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = - 41% STD. DEV. = 28%

Q31 - PERCENT REDUCTION IN PREPARING TIME STANDARDS FOR CYLINDRICAL PARTS -- SYSTEM 3

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -38%
STD. DEV. = 23%
MIN. OBS. = -55%
MAX. OBS. = - 5%

OTHER AEROSPACE

NO. OBS. = 6
MEAN = -33%
STD. DEV. = 27%
MIN. OBS. = -70%
MAX. OBS. = - 5%

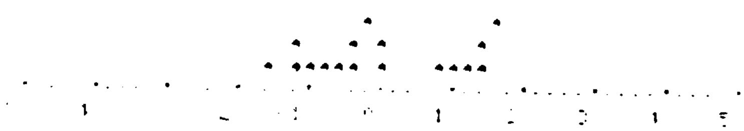
OTHER INDUSTRY

NO. OBS. = 7
MEAN = -49%
STD. DEV. = 28%
MIN. OBS. = -85%
MAX. OBS. = -10%

OBSERVATIONS

ALL RESPONSES

NO. OBS. = 17
MIN. OBS. = -85%
MAX. OBS. = - 5%



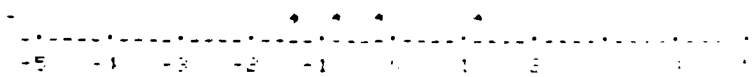
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = - 41% STD. DEV. = 26%

Q31 - PERCENT REDUCTION IN DETERMINING PROCESS PARAMETERS FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

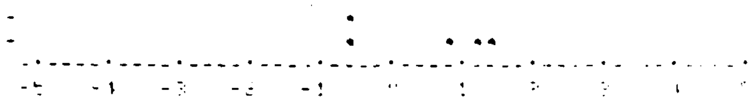
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -48%
STD. DEV. = 30%
MIN. OBS. = -75%
MAX. OBS. = - 5%



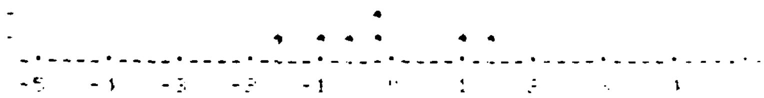
OTHER AEROSPACE

NO. OBS. = 5
MEAN = -24%
STD. DEV. = 24%
MIN. OBS. = -50%
MAX. OBS. = 0%



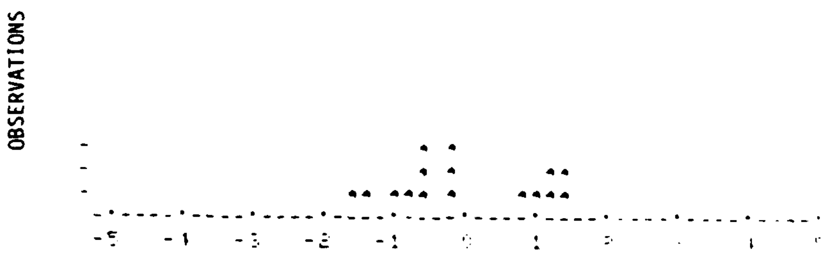
OTHER INDUSTRY

NO. OBS. = 7
MEAN = -40%
STD. DEV. = 28%
MIN. OBS. = -80%
MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 16
MIN. OBS. = -80%
MAX. OBS. = 0%

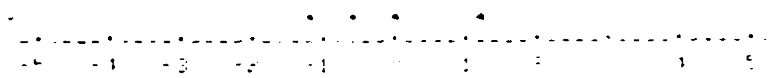


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = - 36% STD. DEV. = 27%

Q31 - PERCENT REDUCTION IN DETERMINING PROCESS PARAMETERS FOR CYLINDRICAL PARTS -- SYSTEM 3

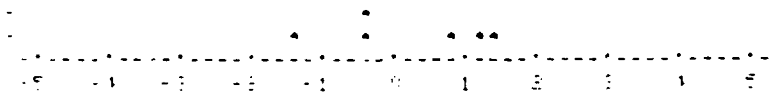
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	-44%
STD. DEV.	=	20%
MIN. OBS.	=	-75%
MAX. OBS.	=	- 5%



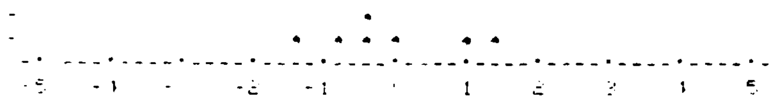
OTHER AEROSPACE

NO. OBS.	=	6
MEAN	=	-33%
STD. DEV.	=	32%
MIN. OBS.	=	-80%
MAX. OBS.	=	0%



OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	-41%
STD. DEV.	=	28%
MIN. OBS.	=	-80%
MAX. OBS.	=	0%



ALL RESPONSES

NO. OBS.	=	17
MIN. OBS.	=	-80%
MAX. OBS.	=	0%

OBSERVATIONS

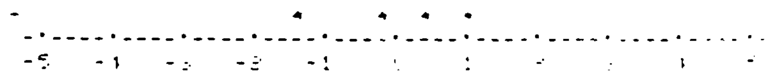
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = - 39% STD. DEV. = 28%

Q31 - PERCENT REDUCTION IN SELECTING TOOLS FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

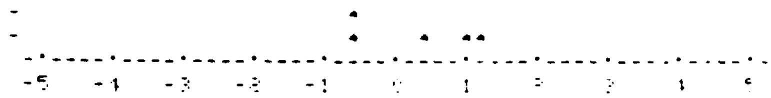
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -36%
STD. DEV. = 30%
MIN. OBS. = -75%
MAX. OBS. = - 5%



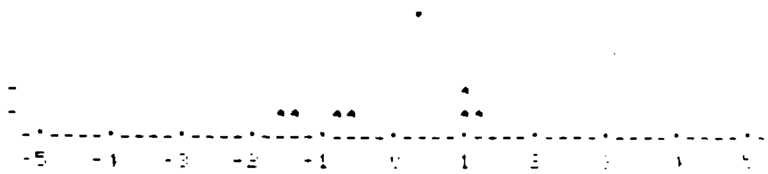
OTHER AEROSPACE

NO. OBS. = 5
MEAN = -29%
STD. DEV. = 22%
MIN. OBS. = -50%
MAX. OBS. = 4%



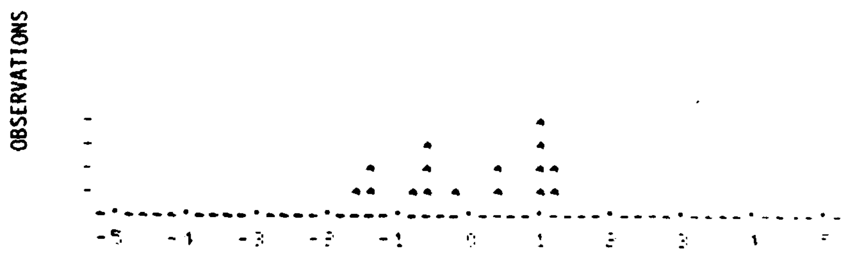
OTHER INDUSTRY

NO. OBS. = 7
MEAN = -41%
STD. DEV. = 33%
MIN. OBS. = -80%
MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 16
MIN. OBS. = -80%
MAX. OBS. = 0%

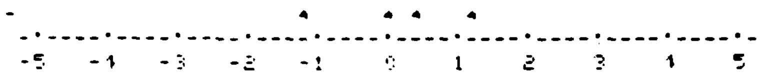


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = -36%   STD. DEV. = 28%

Q31 - PERCENT REDUCTION IN SELECTING TOOLS FOR CYLINDRICAL PARTS -- SYSTEM 3

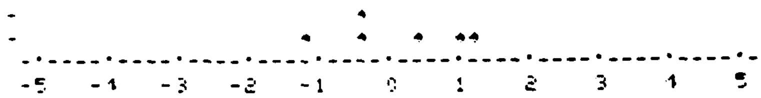
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	-36%
STD. DEV.	=	80%
MIN. OBS.	=	-75%
MAX. OBS.	=	- 5%



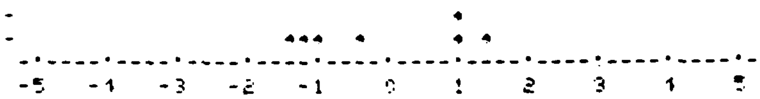
OTHER AEROSPACE

NO. OBS.	=	6
MEAN	=	-35%
STD. DEV.	=	26%
MIN. OBS.	=	-70%
MAX. OBS.	=	- 4%



OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	-41%
STD. DEV.	=	34%
MIN. OBS.	=	-80%
MAX. OBS.	=	0%



ALL RESPONSES

NO. OBS.	=	17
MIN. OBS.	=	-80%
MAX. OBS.	=	0%

OBSERVATIONS

STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = - 38% STD. DEV. = 34%

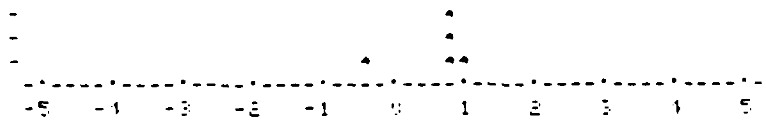
Q31 - PERCENT CHANGE IN SELECTING MACHINES FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -43%
STD. DEV. = 31%
MIN. OBS. = -75%
MAX. OBS. = - 2%

OTHER AEROSPACE

NO. OBS. = 5
MEAN = -16%
STD. DEV. = 19%
MIN. OBS. = -50%
MAX. OBS. = - 3%

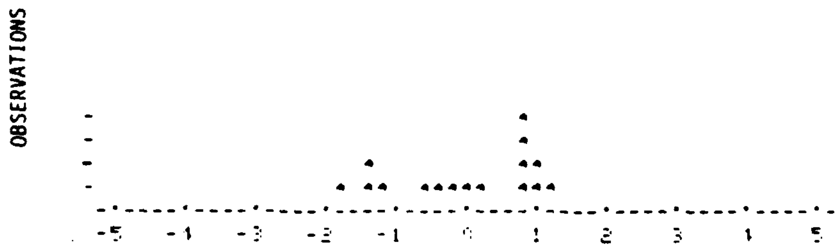


OTHER INDUSTRY

NO. OBS. = 7
MEAN = -44%
STD. DEV. = 35%
MIN. OBS. = -90%
MAX. OBS. = 0%

ALL RESPONSES

NO. OBS. = 16
MIN. OBS. = -90%
MAX. OBS. = 0%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = - 35% STD. DEV. = 31%

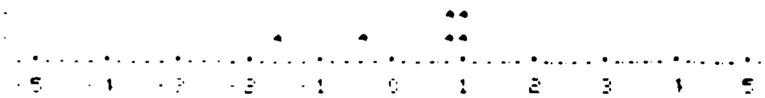
Q31 - PERCENT CHANGE IN SELECTING MACHINES FOR CYLINDRICAL PARTS -- SYSTEM 3

MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	-43%
STD. DEV.	=	31%
MIN. OBS.	=	-75%
MAX. OBS.	=	- 2%

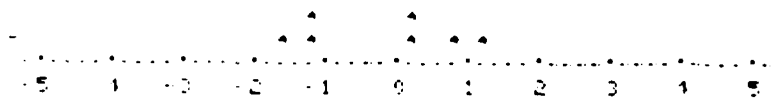
OTHER AEROSPACE

NO. OBS.	=	6
MEAN	=	-29%
STD. DEV.	=	35%
MIN. OBS.	=	-90%
MAX. OBS.	=	- 3%



OTHER INDUSTRY

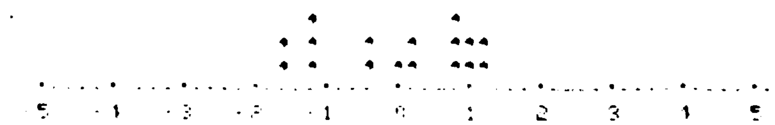
NO. OBS.	=	7
MEAN	=	-45%
STD. DEV.	=	35%
MIN. OBS.	=	-90%
MAX. OBS.	=	0%



OBSERVATIONS

ALL RESPONSES

NO. OBS.	=	17
MIN. OBS.	=	-90%
MAX. OBS.	=	0%



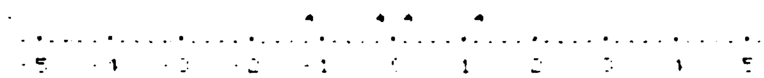
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = - 39% STD. DEV. = 33%

Q31 - PERCENT CHANGE IN DETERMINING OPERATION SEQUENCES FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

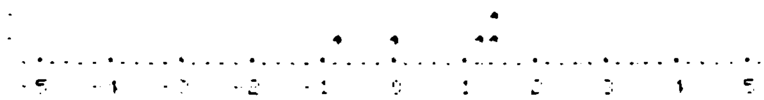
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -49%
STD. DEV. = 33%
MIN. OBS. = -90%
MAX. OBS. = -10%



OTHER AEROSPACE

NO. OBS. = 5
MEAN = -29%
STD. DEV. = 32%
MIN. OBS. = -75%
MAX. OBS. = - 4%

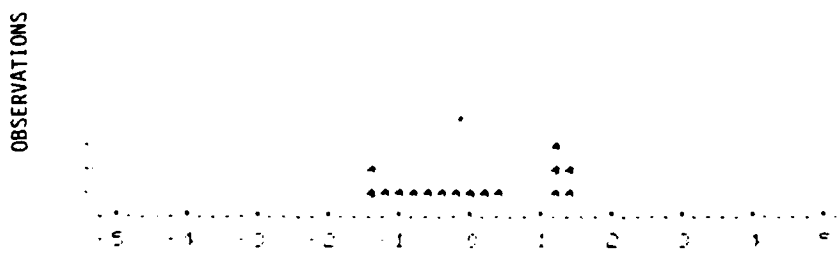


OTHER INDUSTRY

NO. OBS. = 7
MEAN = -63%
STD. DEV. = 32%
MIN. OBS. = -95%
MAX. OBS. = -10%

ALL RESPONSES

NO. OBS. = 16
MIN. OBS. = -95%
MAX. OBS. = - 4%

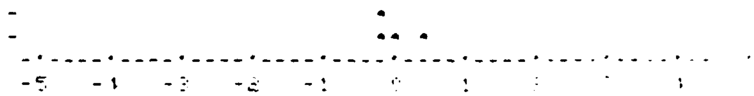


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = - 49%   STD. DEV. = 34%

Q31 - PERCENT REDUCTION IN MATERIAL COST FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

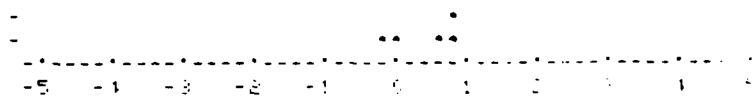
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = - 4.0%
STD. DEV. = 1.4%
MIN. OBS. = - 5%
MAX. OBS. = - 2%



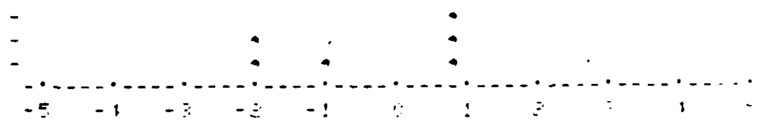
OTHER AEROSPACE

NO. OBS. = 5
MEAN = - 2.0%
STD. DEV. = 2.3%
MIN. OBS. = - 5%
MAX. OBS. = 0%



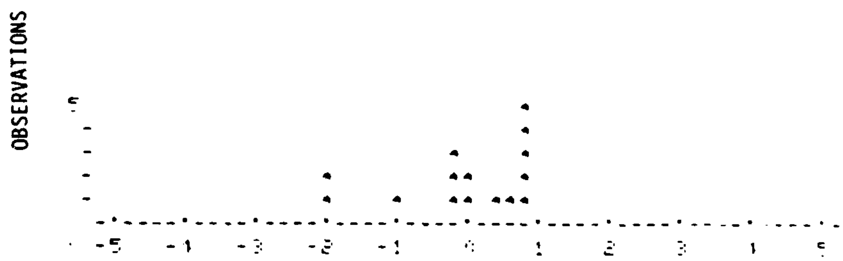
OTHER INDUSTRY

NO. OBS. = 6
MEAN = - 6.7%
STD. DEV. = 7.5%
MIN. OBS. = -15%
MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = -15%
MAX. OBS. = 0%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = - 4.4% STD. DEV. = 5.2%

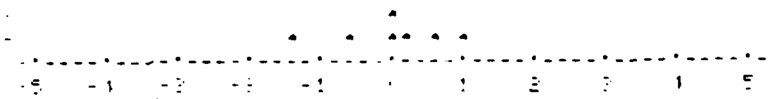
Q31 - PERCENT REDUCTION IN DIRECT LABOR COST FOR CYLINDRICAL PARTS -- SYSTEM 3

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = - 9.8%
STD. DEV. = - 4.1%
MIN. OBS. = -15%
MAX. OBS. = - 5%

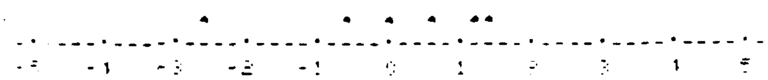
OTHER AEROSPACE

NO. OBS. = 7
MEAN = -10.0%
STD. DEV. = 6.0%
MIN. OBS. = -20%
MAX. OBS. = - 2%



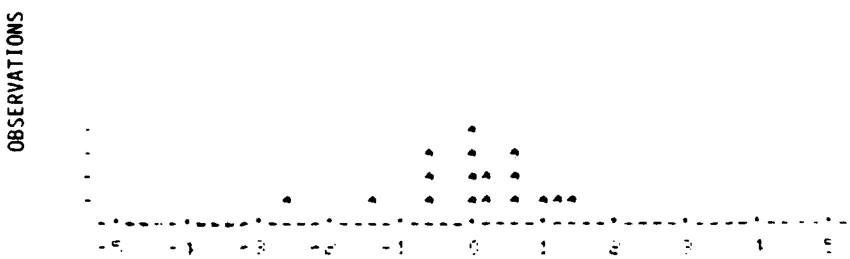
OTHER INDUSTRY

NO. OBS. = 6
MEAN = -10.2%
STD. DEV. = 11.2%
MIN. OBS. = -30%
MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 17
MIN. OBS. = -30%
MAX. OBS. = 0%

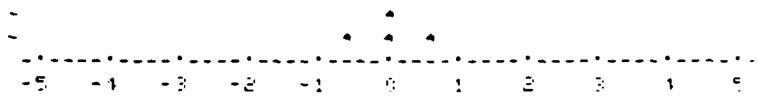


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = - 10.0% STD. DEV. = 7.5%

Q31 - PERCENT REDUCTION IN DIRECT LABOR COST FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

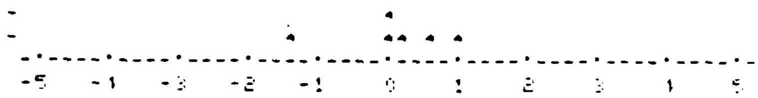
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	- 9.8%
STD. DEV.	=	4.1%
MIN. OBS.	=	-10%
MAX. OBS.	=	- 5%



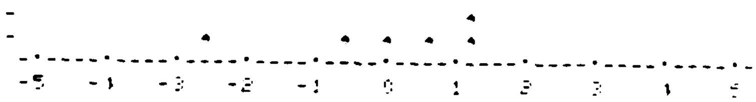
OTHER AEROSPACE

NO. OBS.	=	6
MEAN	=	- 9.2%
STD. DEV.	=	6.1%
MIN. OBS.	=	-20%
MAX. OBS.	=	- 2%



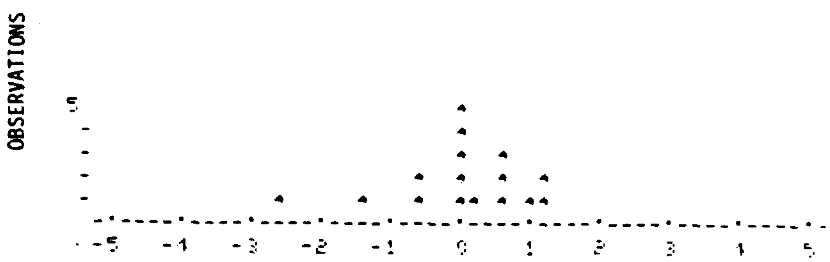
OTHER INDUSTRY

NO. OBS.	=	6
MEAN	=	-10.2%
STD. DEV.	=	11.2%
MIN. OBS.	=	-30%
MAX. OBS.	=	0%



ALL RESPONSES

NO. OBS.	=	16
MIN. OBS.	=	-30%
MAX. OBS.	=	0%



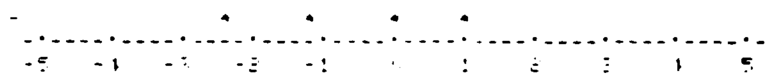
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = - 9.7%   STD. DEV. = 7.6%

Q31 - PERCENT REDUCTION IN SCRAP AND REWORK COST FOR CYLINDRICAL PARTS -- SYSTEM 3

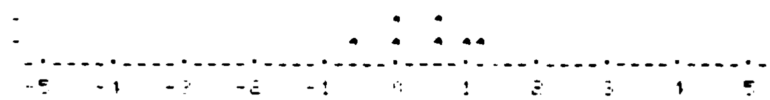
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -15.3%
STD. DEV. = 12.5%
MIN. OBS. = -30%
MAX. OBS. = - 1%



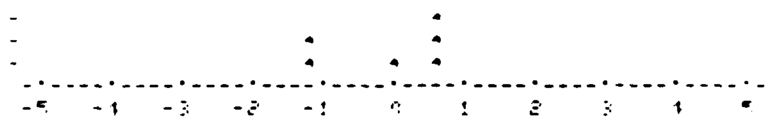
OTHER AEROSPACE

NO. OBS. = 7
MEAN = - 6.6%
STD. DEV. = 5.4%
MIN. OBS. = -15%
MAX. OBS. = 0%



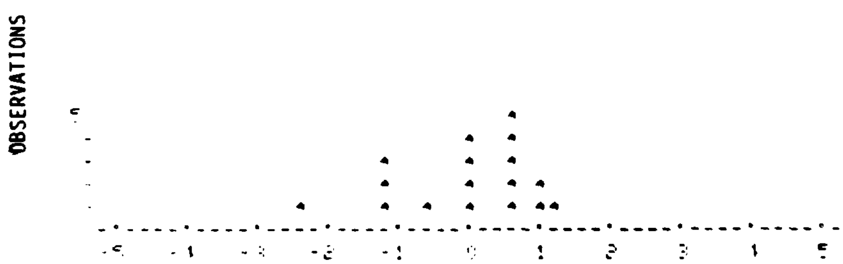
OTHER INDUSTRY

NO. OBS. = 6
MEAN = -10.8%
STD. DEV. = 7.4%
MIN. OBS. = -20%
MAX. OBS. = - 5%



ALL RESPONSES

NO. OBS. = 17
MIN. OBS. = -30%
MAX. OBS. = 0%

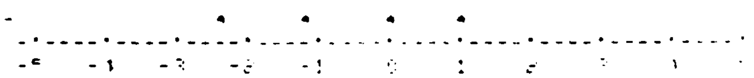


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = - 10.1% STD. DEV. = 8.3%

Q31 - PERCENT REDUCTION IN SCRAP AND REWORK COST FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

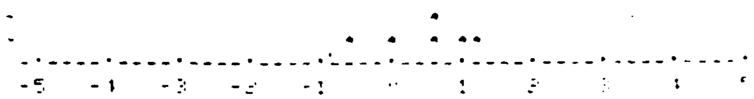
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	-15.3%
STD. DEV.	=	12.5%
MIN. OBS.	=	-30%
MAX. OBS.	=	- 1%



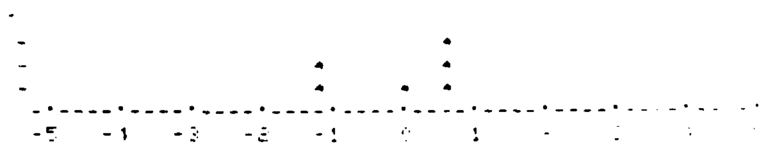
OTHER AEROSPACE

NO. OBS.	=	6
MEAN	=	- 6%
STD. DEV.	=	5.7%
MIN. OBS.	=	-15%
MAX. OBS.	=	0%



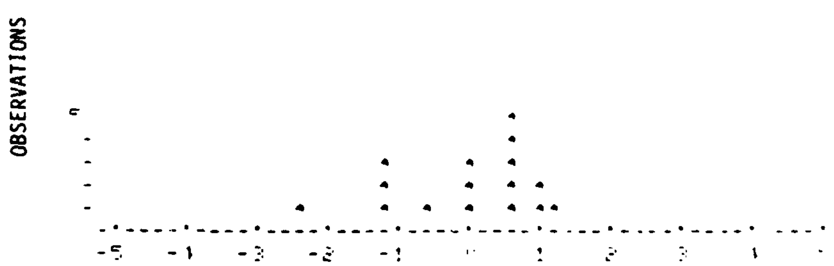
OTHER INDUSTRY

NO. OBS.	=	6
MEAN	=	-10.8%
STD. DEV.	=	7.4%
MIN. OBS.	=	-20%
MAX. OBS.	=	- 5%



ALL RESPONSES

NO. OBS.	=	16
MIN. OBS.	=	-30%
MAX. OBS.	=	0%



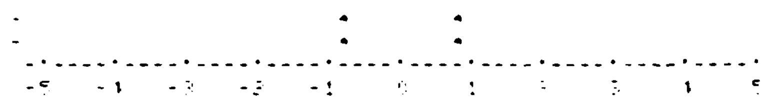
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = - 10.1% STD. DEV. = 8.6%

Q31 - PERCENT REDUCTION IN TOOLING COST FOR CYLINDRICAL PARTS -- SYSTEM 3

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -12.5%
STD. DEV. = 8.7%
MIN. OBS. = -20%
MAX. OBS. = -5%

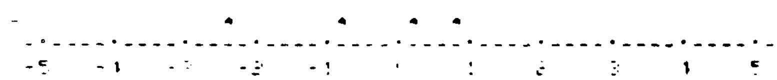


OTHER AEROSPACE

NO. OBS. = 7
MEAN = -8.7%
STD. DEV. = 7.8%
MIN. OBS. = -20%
MAX. OBS. = -1%

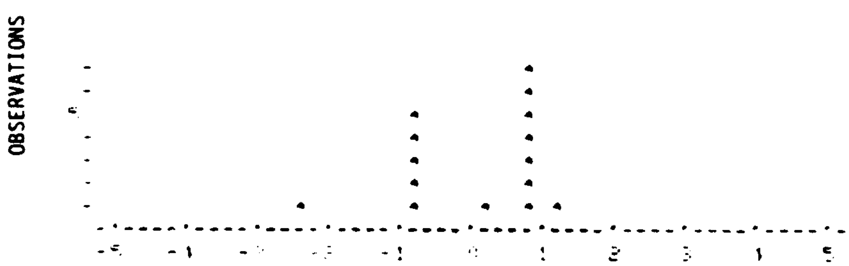
OTHER INDUSTRY

NO. OBS. = 4
MEAN = -17.5%
STD. DEV. = 13.2%
MIN. OBS. = -35%
MAX. OBS. = -5%



ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = -35%
MAX. OBS. = -1%



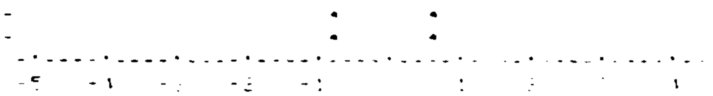
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -12.1% STD. DEV. = 9.7%

Q31 - PERCENT REDUCTION IN TOOLING COST FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

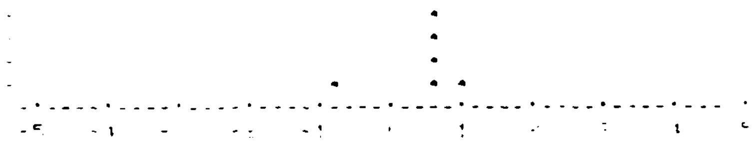
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -12.5%
STD. DEV. = 8.7%
MIN. OBS. = -20%
MAX. OBS. = -5%



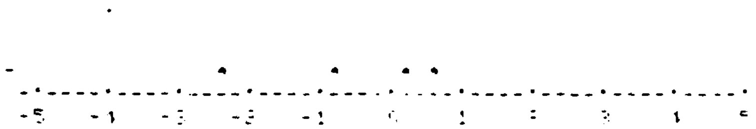
OTHER AEROSPACE

NO. OBS. = 6
MEAN = -6.8%
STD. DEV. = 6.6%
MIN. OBS. = -20%
MAX. OBS. = -1%



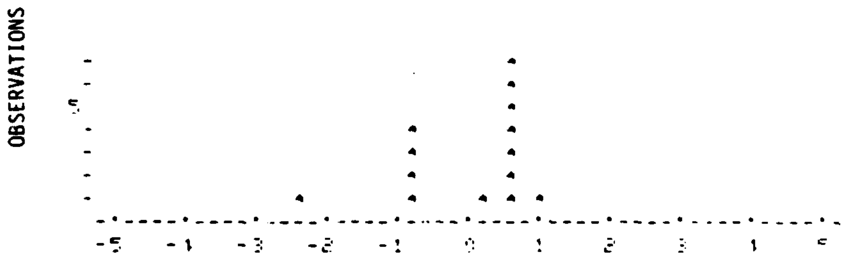
OTHER INDUSTRY

NO. OBS. = 4
MEAN = -17.5%
STD. DEV. = 13.2%
MIN. OBS. = -35%
MAX. OBS. = -5%



ALL RESPONSES

NO. OBS. = 14
MIN. OBS. = -35%
MAX. OBS. = -1%



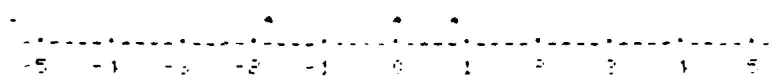
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -11.5%   STD. DEV. = 9.8%

Q31 - PERCENT REDUCTION IN WORK IN PROCESS INVENTORY FOR CYLINDRICAL PARTS -- SYSTEM 3

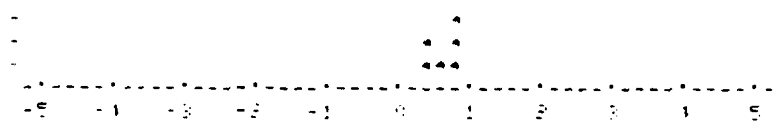
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = -9%
STD. DEV. = 10.1%
MIN. OBS. = -20%
MAX. OBS. = 0%



OTHER AEROSPACE

NO. OBS. = 6
MEAN = -1.3%
STD. DEV. = 1.5%
MIN. OBS. = -3%
MAX. OBS. = 0%

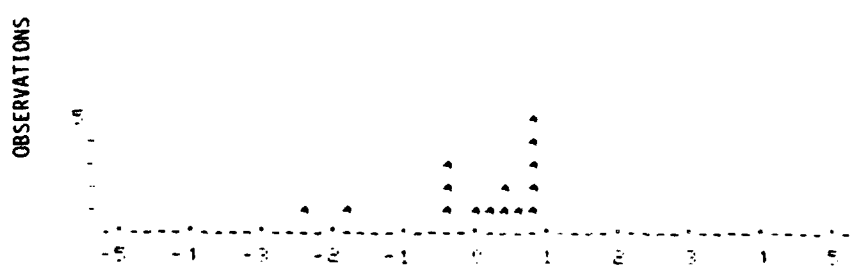


OTHER INDUSTRY

NO. OBS. = 6
MEAN = -10%
STD. DEV. = 8.4%
MIN. OBS. = -25%
MAX. OBS. = 0%

ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = -25%
MAX. OBS. = 0%



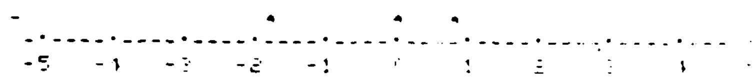
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -6.3% STD. DEV. = 7.7%

Q31 - PERCENT REDUCTION IN WORK IN PROCESS INVENTORY FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

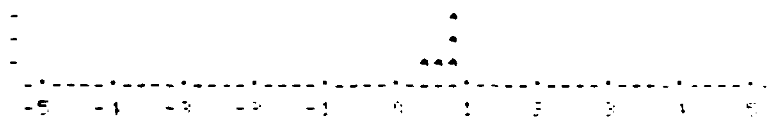
MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	-9%
STD. DEV.	=	10.1%
MIN. OBS.	=	-20%
MAX. OBS.	=	0%



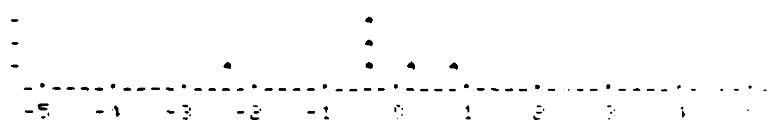
OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	-1%
STD. DEV.	=	1.4%
MIN. OBS.	=	-3%
MAX. OBS.	=	0%



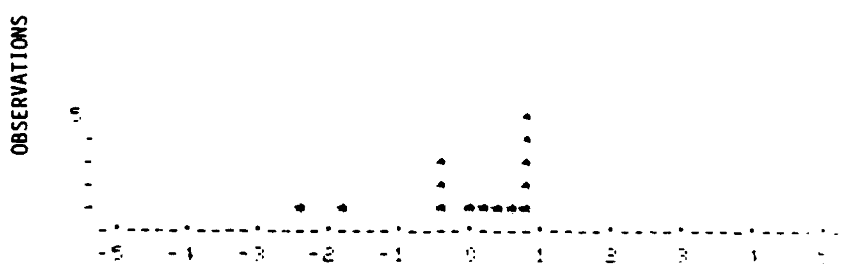
OTHER INDUSTRY

NO. OBS.	=	6
MEAN	=	-10%
STD. DEV.	=	9.4%
MIN. OBS.	=	-25%
MAX. OBS.	=	0%



ALL RESPONSES

NO. OBS.	=	14
MIN. OBS.	=	-25%
MAX. OBS.	=	0%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -6.6% STD. DEV. = 7.9%

Q32 - IMPACT OF SYSTEM 3 ON OTHER AREAS (RANKED ON A SCALE OF -2 TO +2, WHERE -2 = SIGNIFICANTLY NEGATIVE IMPACT, 0 = NO CHANGE, +2 = SIGNIFICANT IMPROVEMENT)

AREAS IMPACTED	MISSILE PRIME AND SUBS.					OTHER AEROSPACE					OTHER INDUSTRY					TOTAL				
	-2	-1	0	+1	+2	-2	-1	0	+1	+2	-2	-1	0	+1	+2	-2	-1	0	+1	+2
PRODUCTION LEADTIME				2	2			1	2	4				4	4			1	8	10
PROCESS PLANNING LEADTIME					4					7				2	6				2	17
MACHINE UTILIZATION				2	2			1	2	4			1	2	5			2	6	9
PRODUCT QUALITY			1	3				1	5	1			3	5				5	13	1
DIRECT LABOR UTILIZATION			1	2	1			1	3	2			2	5	1			4	10	4
UNIFORMITY OF PROCESS PLANS					4				1	6				1	7				2	17
COST ESTIMATING PROCEDURES				1	3				1	6				2	6				4	15
MAKE/BUY DECISIONS				2	1			1	5	1			1	1	6			2	8	8
PRODUCT STANDARDIZATION				1	2				4	3			3	1	4			3	6	9
CRITICAL LABOR SKILLS				2	1			2	3	2			6	1	1			8	6	4
MATERIAL STANDARDIZATION				3	1			2	3	2			4	3	1			6	9	4
PRODUCIBILITY OF PARTS.			1	2	1			1	3	3			2	4	2			4	9	6
PLANT LAYOUT			2	2				3	1	3			2	5	1			7	8	4
MATERIAL HANDLING			1	2				1	4	2			1	5	2			3	11	4
PRODUCTION SCHEDULING				2	2			2	3	2				3	5			2	8	9
CAPACITY PLANNING				3	1			2	2	3				3	5			2	8	9

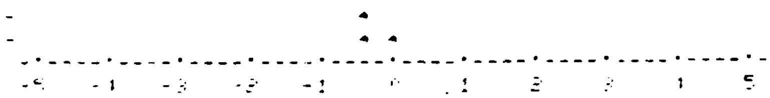
Q33 - HARDWARE COSTS -- SYSTEM 3 FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	$178.0K
STD. DEV.	=	$251.0K
MIN. OBS.	=	$12.0K
MAX. OBS.	=	$550.0K

OTHER AEROSPACE

NO. OBS.	=	3
MEAN	=	$82.0K
STD. DEV.	=	$103.0K
MIN. OBS.	=	$15.0K
MAX. OBS.	=	$200.0K

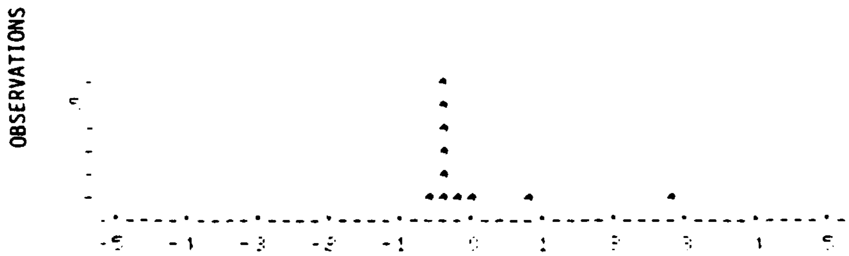


OTHER INDUSTRY

NO. OBS.	=	4
MEAN	=	$377.0K
STD. DEV.	=	$683.0K
MIN. OBS.	=	$20.0K
MAX. OBS.	=	$1,400K

ALL RESPONSES

NO. OBS.	=	11
MIN. OBS.	=	$12.0K
MAX. OBS.	=	$1,400K



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $224.0K   STD. DEV. = $421.0K

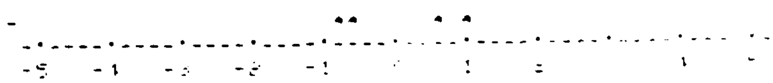
Q33 - HARDWARE COSTS -- SYSTEM 3 FOR NON-CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	$203.0K
STD. DEV.	=	$245K
MIN. OBS.	=	$12K
MAX. OBS.	=	$550K

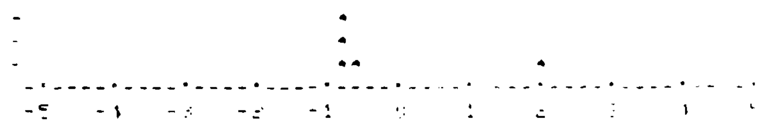
OTHER AEROSPACE

NO. OBS.	=	4
MEAN	=	$190.0K
STD. DEV.	=	$190.0K
MIN. OBS.	=	$15.0K
MAX. OBS.	=	$400K



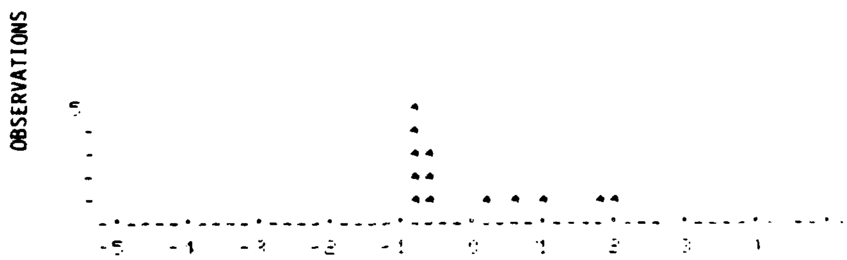
OTHER INDUSTRY

NO. OBS.	=	5
MEAN	=	$137.0K
STD. DEV.	=	$259.0K
MIN. OBS.	=	$12.0K
MAX. OBS.	=	$600.0K



ALL RESPONSES

NO. OBS.	=	13
MIN. OBS.	=	12K
MAX. OBS.	=	$600.0K



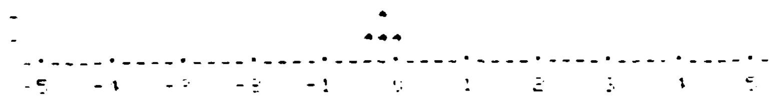
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $174.0K STD. DEV. = $217.0K

Q33 - COSTS TO ESTABLISH INITIAL DATA FILES -- SYSTEM 3 FOR CYLINDRICAL PARTS

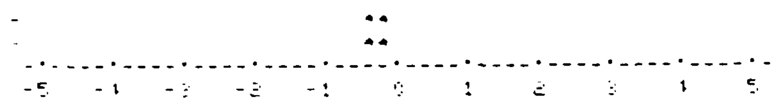
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	$109.0K
STD. DEV.	=	$127.5K
MIN. OBS.	=	$36.0K
MAX. OBS.	=	$300.0K



OTHER AEROSPACE

NO. OBS.	=	4
MEAN	=	$52.8K
STD. DEV.	=	$45.3K
MIN. OBS.	=	$ 1.2K
MAX. OBS.	=	$100.0K

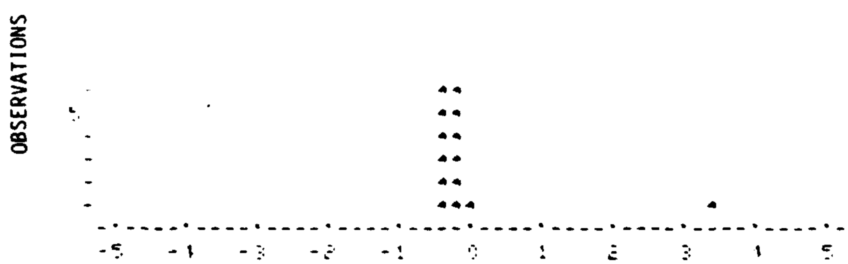


OTHER INDUSTRY

NO. OBS.	=	6
MEAN	=	$625.8K
STD. DEV.	=	$1,409K
MIN. OBS.	=	$ 1.0K
MAX. OBS.	=	$3,500K

ALL RESPONSES

NO. OBS.	=	14
MIN. OBS.	=	$ 1.0K
MAX. OBS.	=	$3,500K



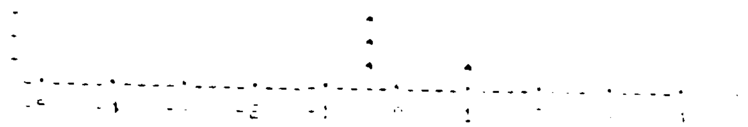
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $314.4K STD. DEV. = $919.9K

Q33 - COSTS TO ESTABLISH INITIAL DATA FILES -- SYSTEM 3 FOR NON-CYLINDRICAL PARTS

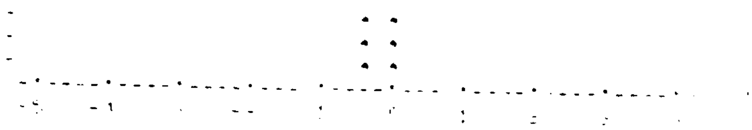
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	$188.8K
STD. DEV.	=	$274.4K
MIN. OBS.	=	$40.0K
MAX. OBS.	=	$600K



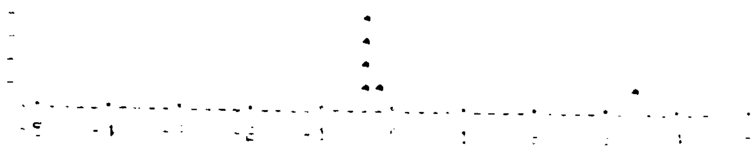
OTHER AEROSPACE

NO. OBS.	=	6
MEAN	=	$128.5K
STD. DEV.	=	$72.3K
MIN. OBS.	=	$45.0K
MAX. OBS.	=	$200.0K



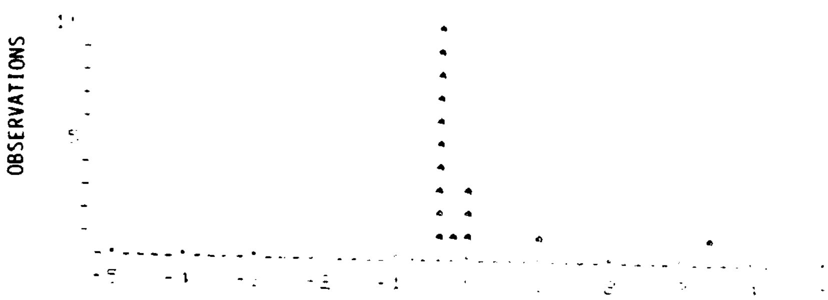
OTHER INDUSTRY

NO. OBS.	=	6
MEAN	=	$289.7K
STD. DEV.	=	$594.0K
MIN. OBS.	=	$19.0K
MAX. OBS.	=	$1,500K



ALL RESPONSES

NO. OBS.	=	16
MIN. OBS.	=	$19.0K
MAX. OBS.	=	$1,500K



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $204.0K STD. DEV = $373.8K

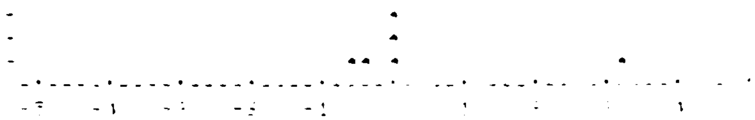
i3 - COST PER YEAR FOR COMPUTER CHARGES AND PROGRAM MAINTENANCE -- SYSTEM 3 FOR NON-CYLINDRICAL PARTS

:SSILE PRIMES & SUBS

). OBS.	=	4
:AN	=	$66.7K
'D. DEV.	=	$24.1K
:N. OBS.	=	$48.0K
\X. OBS.	=	$100.0K

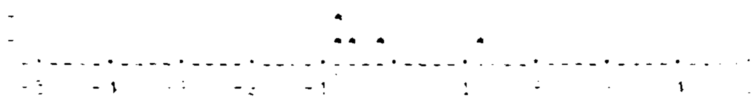
'HER AEROSPACE

). OBS.	=	6
:AN	=	$115.0K
'D. DEV.	=	$141.0K
:N. OBS.	=	$15.0K
\X. OBS.	=	$400.0K



'HER INDUSTRY

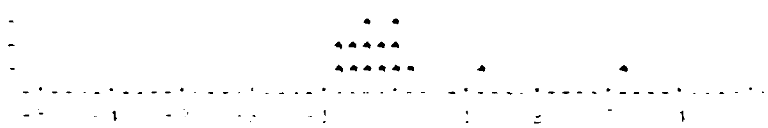
). OBS.	=	5
:AN	=	$56.8K
'D. DEV.	=	$82.9K
:N. OBS.	=	$ 1.0K
\X. OBS.	=	$200.0K



OBSERVATIONS

.L RESPONSES

). OBS.	=	15
:N. OBS.	=	$ 1.0K
\X. OBS.	=	$400.0K



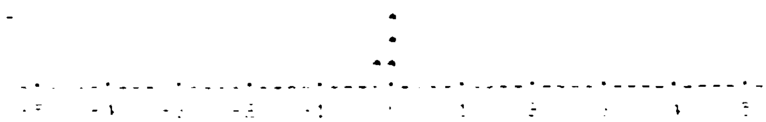
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $82.7K STD DEV = $100.2K

Q33 - COST PER YEAR FOR COMPUTER CHARGES AND PROGRAM MAINTENANCE -- SYSTEM 3 FOR CYLINDRICAL PARTS

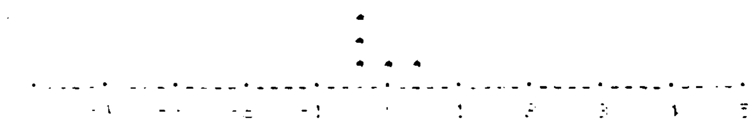
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	$49.9K
STD. DEV.	=	$11.3K
MIN. OBS.	=	$36.0K
MAX. OBS.	=	$63.6K



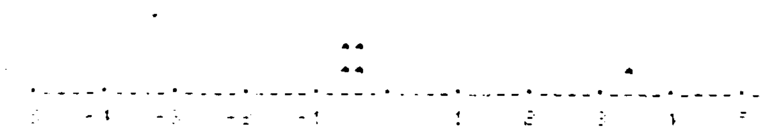
OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	$42.6K
STD. DEV.	=	$34.7K
MIN. OBS.	=	$15.0K
MAX. OBS.	=	$100.0K



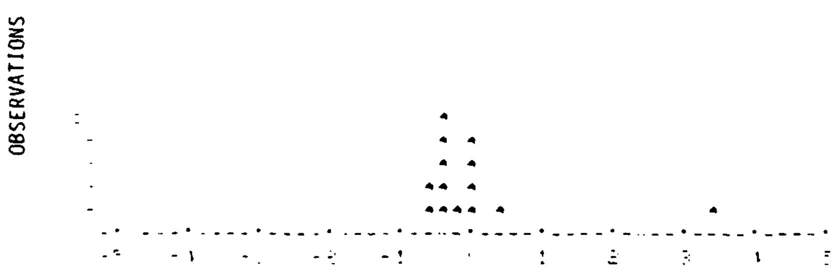
OTHER INDUSTRY

NO. OBS.	=	5
MEAN	=	$77.6K
STD. DEV.	=	$152.5K
MIN. OBS.	=	$ 1.0K
MAX. OBS.	=	$350.0K



ALL RESPONSES

NO. OBS.	=	14
MIN. OBS.	=	$ 1.0K
MAX. OBS.	=	$350.0K



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $57.2K STD. DEV. = $884K

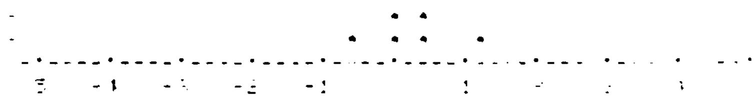
Q33 - MONTHS TO TEST SYSTEM -- SYSTEM 3 FOR NON-CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 3.6 mo.
STD. DEV. = 1.9 mo.
MIN. OBS. = 1.5 mo.
MAX. OBS. = 6.0 mo.

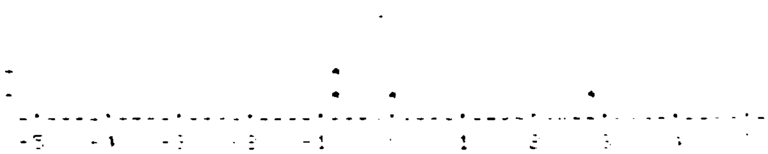
OTHER AEROSPACE

NO. OBS. = 6
MEAN = 7.2 mo.
STD. DEV. = 3.0 mo.
MIN. OBS. = 3.0 mo.
MAX. OBS. = 12.0 mo.



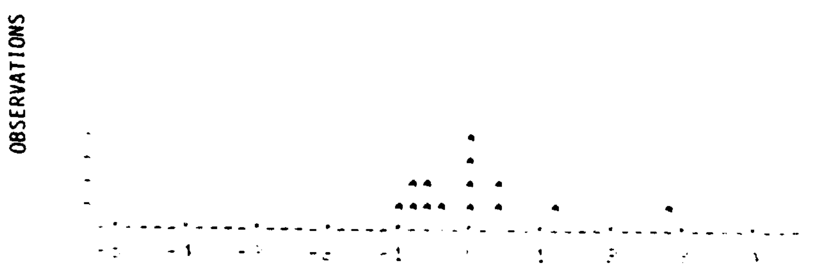
OTHER INDUSTRY

NO. OBS. = 4
MEAN = 7.5 mo.
STD. DEV. = 8.5 mo.
MIN. OBS. = 2.0 mo.
MAX. OBS. = 20.0 mo.



ALL RESPONSES

NO. OBS. = 14
MIN. OBS. = 1.5 mo.
MAX. OBS. = 20.0 mo.



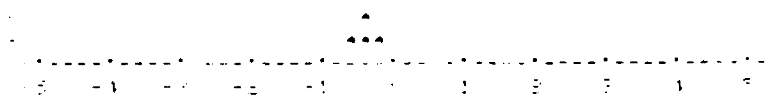
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 6.3 mo. STD. DEV. = 4.9 mo.

Q33 - MONTHS TO TEST SYSTEM -- SYSTEM 3 FOR CYLINDRICAL PARTS

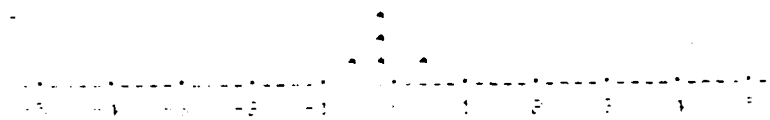
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 3.4 mo.
STD. DEV. = 1.9 mo.
MIN. OBS. = 1.5 mo.
MAX. OBS. = 6.0 mo.



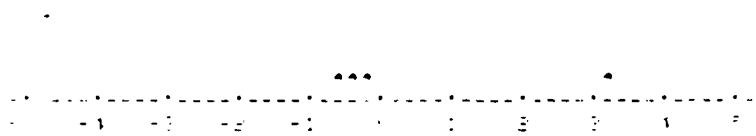
OTHER AEROSPACE

NO. OBS. = 5
MEAN = 6.2 mo.
STD. DEV. = 3.9 mo.
MIN. OBS. = 1.0 mo.
MAX. OBS. = 12.0 mo.



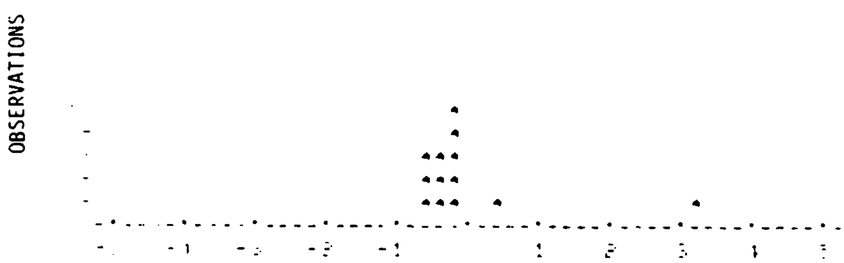
OTHER INDUSTRY

NO. OBS. = 4
MEAN = 12.8 mo.
STD. DEV. = 18.4 mo.
MIN. OBS. = 2.0 mo.
MAX. OBS. = 40.0 mo.



ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = 1.0 mo.
MAX. OBS. = 40.0 mo.

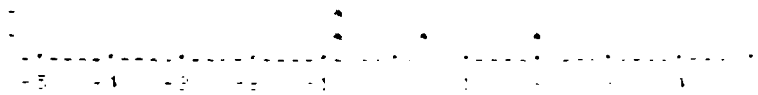


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 7.3 mo. STD. DEV. = 10.2 mo.

Q33 - MONTHS TO TRAIN PERSONNEL -- SYSTEM 3 FOR NON-CYLINDRICAL PARTS

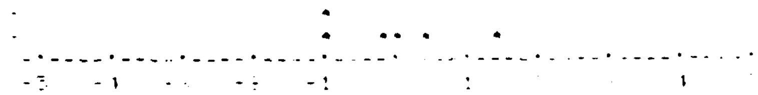
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 5.4 mo.
STD. DEV. = 4.9 mo.
MIN. OBS. = 1.5 mo.
MAX. OBS. = 12.0 mo.



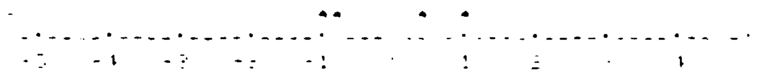
OTHER AEROSPACE

NO. OBS. = 6
MEAN = 4.5 mo.
STD. DEV. = 3.4 mo.
MIN. OBS. = 1.0 mo.
MAX. OBS. = 10.0 mo.



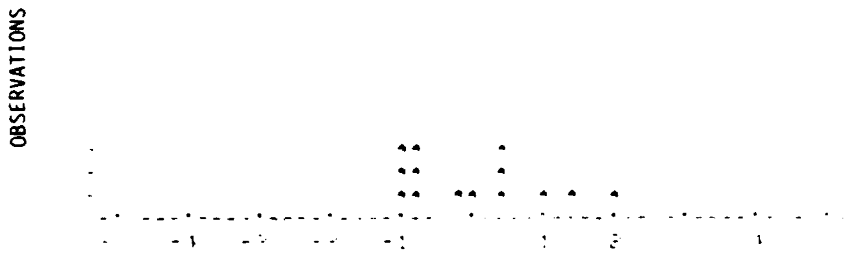
OTHER INDUSTRY

NO. OBS. = 4
MEAN = 4.3 mo.
STD. DEV. = 3.3 mo.
MIN. OBS. = 1.0 mo.
MAX. OBS. = 8.0 mo.



ALL RESPONSES

NO. OBS. = 14
MIN. OBS. = 1.0 mo.
MAX. OBS. = 12.0 mo.



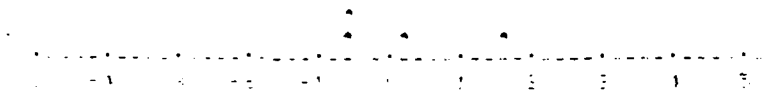
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 4.7 mo. STD. DEV. = 3.6 mo.

Q33 - MONTHS TO TRAIN PERSONNEL -- SYSTEM 3 FOR CYLINDRICAL PARTS

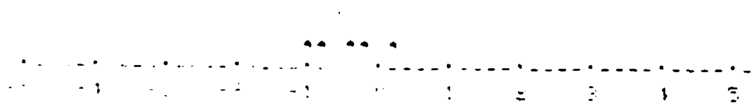
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 5.4 mo.
STD. DEV. = 4.9 mo.
MIN. OBS. = 1.5 mo.
MAX. OBS. = 12.0 mo.



OTHER AEROSPACE

NO. OBS. = 5
MEAN = 2.9 mo.
STD. DEV. = 2.2 mo.
MIN. OBS. = 0.5 mo.
MAX. OBS. = 6.0 mo.

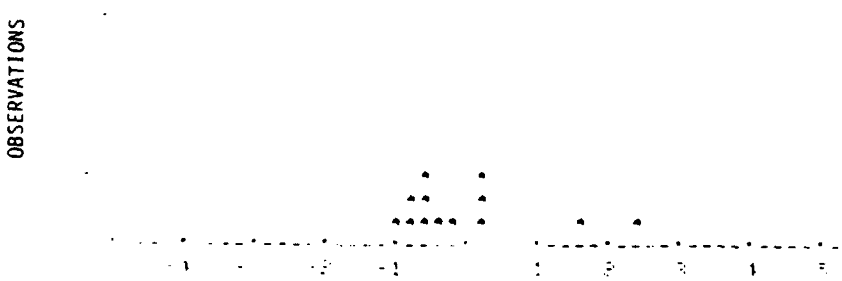


OTHER INDUSTRY

NO. OBS. = 4
MEAN = 6.3 mo.
STD. DEV. = 6.8 mo.
MIN. OBS. = 1.0 mo.
MAX. OBS. = 16.0 mo.

ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = 0.5 mo
MAX. OBS. = 16.0 mo.



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 4.7 mo. STD. DEV. = 4.6 mo.

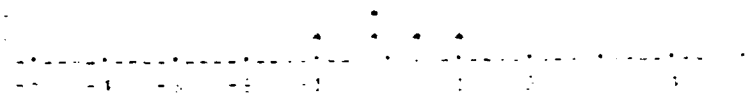
Q33 - MONTHS TO ESTABLISH DATA FILES -- SYSTEM 3 FOR NON-CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	12.0 mo.
STD. DEV.	=	8.2 mo.
MIN. OBS.	=	6.0 mo.
MAX. OBS.	=	24.0 mo.

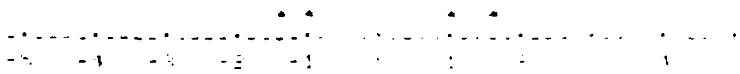
OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	13.0 mo.
STD. DEV.	=	5.1 mo.
MIN. OBS.	=	6.0 mo.
MAX. OBS.	=	20.0 mo.



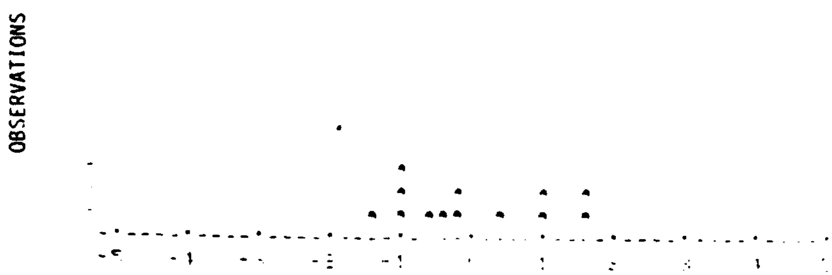
OTHER INDUSTRY

NO. OBS.	=	4
MEAN	=	13.4 mo.
STD. DEV.	=	10.3 mo.
MIN. OBS.	=	3.0 mo.
MAX. OBS.	=	24.0 mo.



ALL RESPONSES

NO. OBS.	=	13
MIN. OBS.	=	3.0 mo.
MAX. OBS.	=	24.0 mo.



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 12.8 mo. STD. DEV. = 7.2 mo.

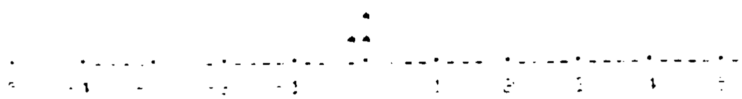
033 - MONTHS TO ESTABLISH DATA FILES -- SYSTEM 3 FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	11.0 mo.
STD. DEV.	=	8.7 mo.
MIN. OBS.	=	6.0 mo.
MAX. OBS.	=	24.0 mo.

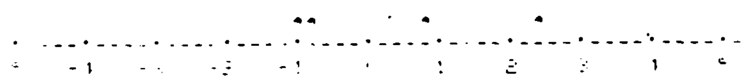
OTHER AEROSPACE

NO. OBS.	=	3
MEAN	=	13.7 mo.
STD. DEV.	=	1.5 mo.
MIN. OBS.	=	12.0 mo
MAX. OBS.	=	14.0 mo.



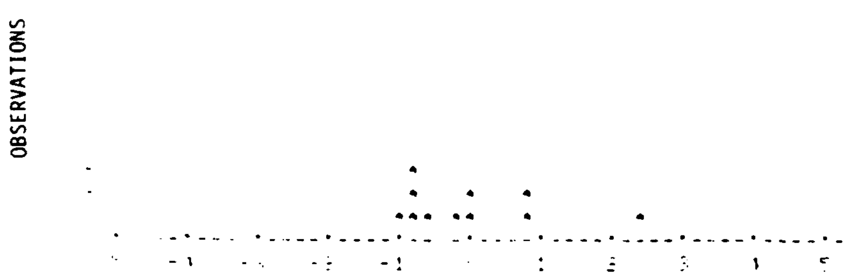
OTHER INDUSTRY

NO. OBS.	=	4
MEAN	=	18.3 mo.
STD. DEV.	=	17.2 mo.
MIN. OBS.	=	3.0 mo.
MAX. OBS.	=	40.0 mo.



ALL RESPONSES

NO. OBS.	=	11
MIN. OBS.	=	3.0 mo.
MAX. OBS.	=	40.0 mo.



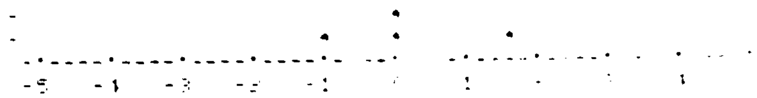
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 14.4 mo. STD. DEV. = 11.1 mo.

Q33 - MONTHS TO ACQUIRE HARDWARE -- SYSTEM 3 FOR NON-CYLINDRICAL PARTS

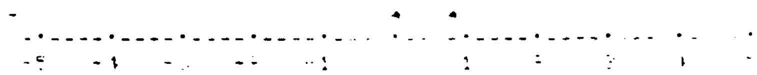
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	6.5 mo.
STD. DEV.	=	4.0 mo.
MIN. OBS.	=	2.0 mo.
MAX. OBS.	=	12.0 mo.



OTHER AEROSPACE

NO. OBS.	=	2
MEAN	=	7.5 mo.
STD. DEV.	=	2.0 mo.
MIN. OBS.	=	6.0 mo.
MAX. OBS.	=	9.0 mo.

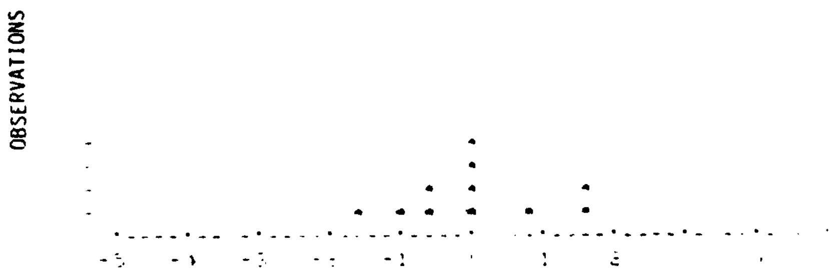


OTHER INDUSTRY

NO. OBS.	=	5
MEAN	=	5.2 mo.
STD. DEV.	=	4.4 mo.
MIN. OBS.	=	0 mo.
MAX. OBS.	=	12.0 mo.

ALL RESPONSES

NO. OBS.	=	11
MIN. OBS.	=	0 mo.
MAX. OBS.	=	12 mo.



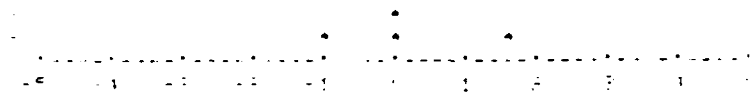
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 6.1 mo. STD. DEV. = 3.8 mo.

Q33 - MONTHS TO ACQUIRE HARDWARE -- SYSTEM 3 FOR CYLINDRICAL PARTS

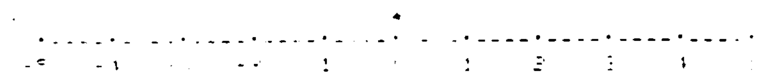
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	6.5 mo.
STD. DEV.	=	4.1 mo.
MIN. OBS.	=	2 mo.
MAX. OBS.	=	12 mo.



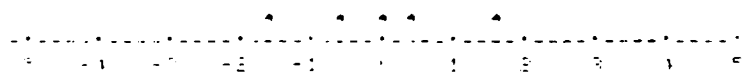
OTHER AEROSPACE

NO. OBS.	=	1
MEAN	=	6 mo.
STD. DEV.	=	0 mo.
MIN. OBS.	=	6 mo.
MAX. OBS.	=	6 mo.



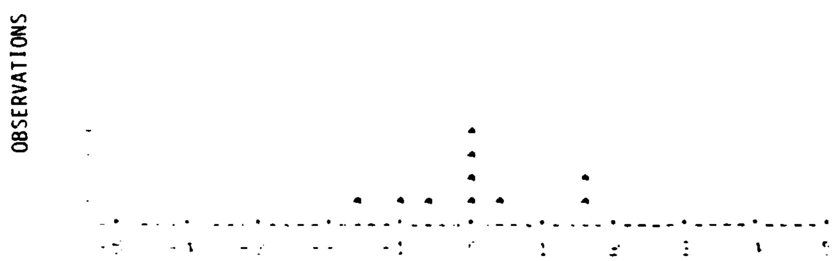
OTHER INDUSTRY

NO. OBS.	=	5
MEAN	=	6 mo.
STD. DEV.	=	4.5 mo.
MIN. OBS.	=	0 mo.
MAX. OBS.	=	12 mo.



ALL RESPONSES

NO. OBS.	=	10
MIN. OBS.	=	0 mo.
MAX. OBS.	=	12 mo.



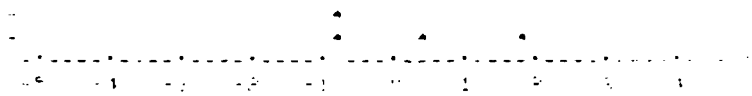
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 6.2 mo. STD. DEV. = 3.8 mo.

Q33 - COST TO TEST SYSTEM -- SYSTEM 3 FOR NON-CYLINDRICAL PARTS

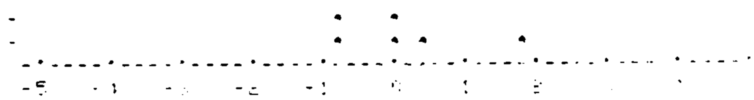
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	$43.6K
STD. DEV.	=	$41.6K
MIN. OBS.	=	$10.0K
MAX. OBS.	=	$14.5K



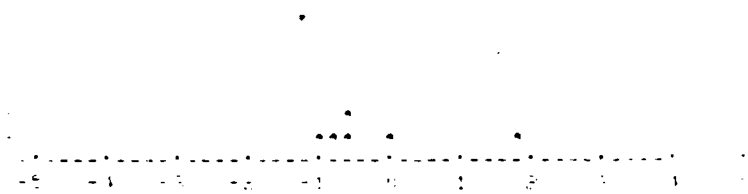
OTHER AEROSPACE

NO. OBS.	=	6
MEAN	=	$41.5K
STD. DEV.	=	$32.8K
MIN. OBS.	=	$10.0K
MAX. OBS.	=	$100.0K



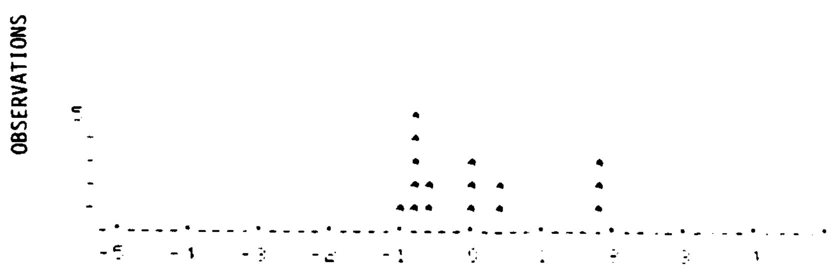
OTHER INDUSTRY

NO. OBS.	=	6
MEAN	=	$ 318K
STD. DEV.	=	$35.5K
MIN. OBS.	=	$ 6.0K
MAX. OBS.	=	$100.0K



ALL RESPONSES

NO. OBS.	=	16
MIN. OBS.	=	$6.0K
MAX. OBS.	=	$100.0K



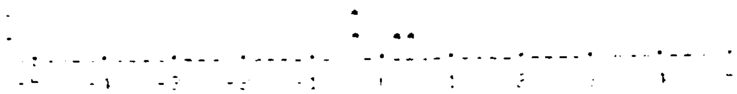
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $38.4K STD. DEV. = $34.6K

Q33 - COST TO TEST SYSTEM -- SYSTEM 3 FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	$27.7K
STD. DEV.	=	$20.4K
MIN. OBS.	=	$10.0K
MAX. OBS.	=	$20.0K



OTHER AEROSPACE

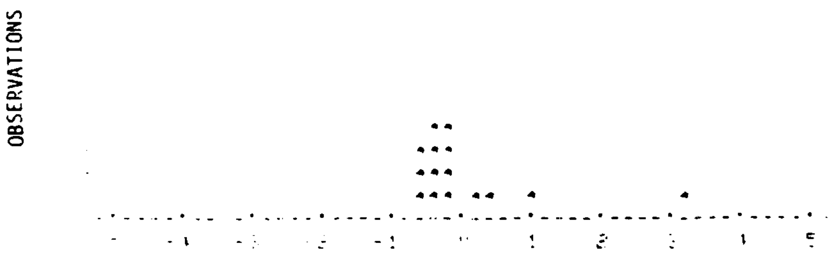
NO. OBS.	=	5
MEAN	=	$15.4K
STD. DEV.	=	$ 9.3K
MIN. OBS.	=	$ 2.0K
MAX. OBS.	=	$25.0K

OTHER INDUSTRY

NO. OBS.	=	6
MEAN	=	$53.6K
STD. DEV.	=	$77.2K
MIN. OBS.	=	$ 0.5K
MAX. OBS.	=	$20.0K

ALL RESPONSES

NO. OBS.	=	15
MIN. OBS.	=	$ 0.5K
MAX. OBS.	=	$50.0K



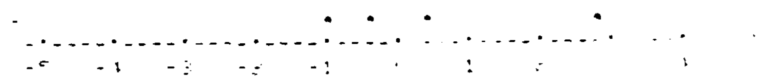
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $34.0K STD. DEV. = $50.4K

Q33 - COSTS TO TRAIN PERSONNEL -- SYSTEM 3 FOR NON-CYLINDRICAL PARTS

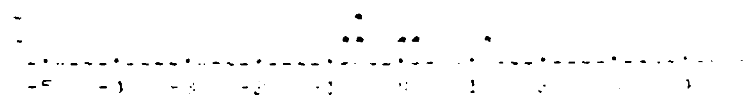
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = $31.9K
STD. DEV. = $34.0K
MIN. OBS. = $ 2.5K
MAX. OBS. = $80.0K



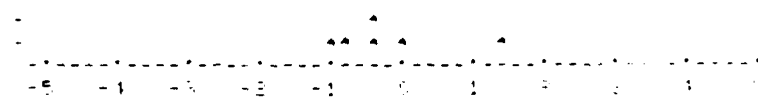
OTHER AEROSPACE

NO. OBS. = 6
MEAN = $19.5K
STD. DEV. = $14.8K
MIN. OBS. = $ 6.0K
MAX OBS. = $45.0K



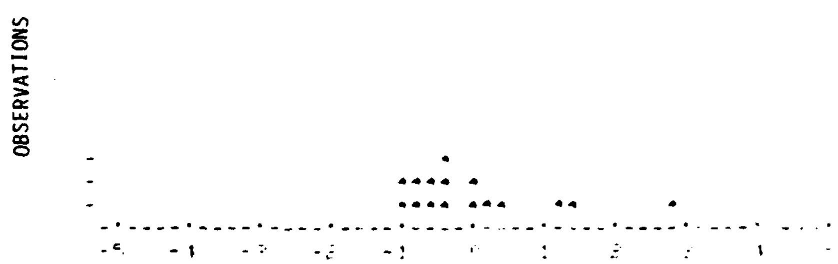
OTHER INDUSTRY

NO. OBS. = 6
MEAN = $18.0K
STD. DEV. = $16.9K
MIN. OBS. = $ 2.9K
MAX. OBS. = $50.0K



ALL RESPONSES

NO. OBS. = 16
MIN. OBS. = $ 2.5K
MAX. OBS. = $80.0K



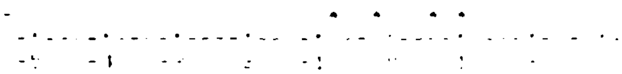
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $22.0K STD. DEV. = $20.8K

Q33 - COSTS TO TRAIN PERSONNEL -- SYSTEM 3 FOR CYLINDRICAL PARTS

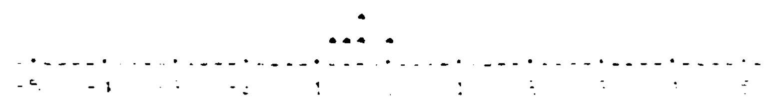
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	$21.9K
STD. DEV.	=	$16.5K
MIN. OBS.	=	$ 2.5K
MAX. OBS.	=	$40.0K



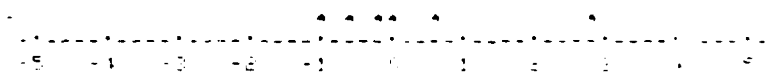
OTHER AEROSPACE

NO. OBS	=	5
MEAN	=	$ 9.8 K
STD. DEV.	=	$ 5.7K
MIN. OBS.	=	$ 2.0K
MAX. OBS.	=	$18.0K



OTHER INDUSTRY

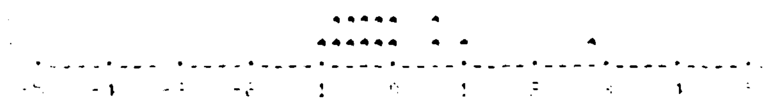
NO. OBS.	=	6
MEAN	=	$24.7K
STD. DEV.	=	$27.0K
MIN. OBS.	=	$ 0.2K
MAX. OBS.	=	$75.0K



OBSERVATIONS

ALL RESPONSES

NO. OBS.	=	15
MIN. OBS.	=	$ 0.2K
MAX. OBS.	=	$75.0K



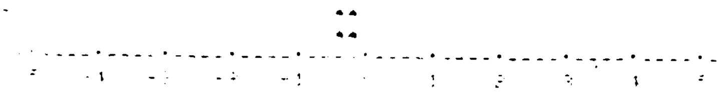
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $19.0K STD. DEV. = $19.1K

Q33 - COST PER YEAR FOR UPDATING DATA FILES -- SYSTEM 3 FOR CYLINDRICAL PARTS

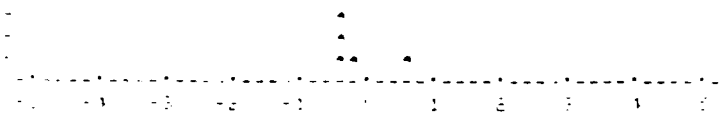
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	$17.5K
STD. DEV.	=	$ 6.0K
MIN. OBS.	=	$10.0K
MAX. OBS.	=	$24.0K



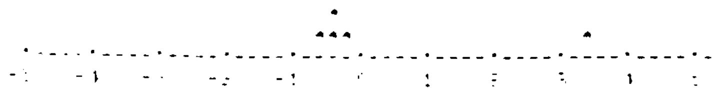
OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	$34.2K
STD. DEV.	=	$38.4K
MIN. OBS.	=	$ 4.0K
MAX. OBS.	=	$100.0K



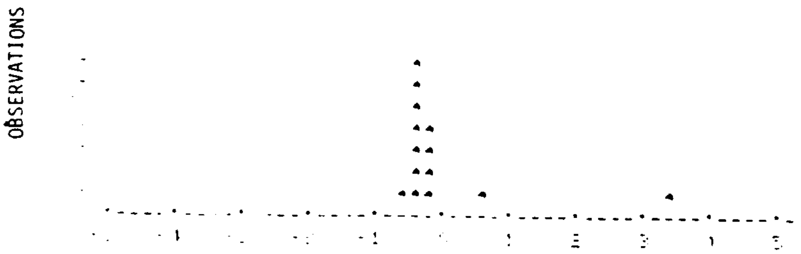
OTHER INDUSTRY

NO. OBS.	=	5
MEAN	=	$80.7K
STD. DEV.	=	$151.0K
MIN. OBS.	=	$ 0.5K
MAX. OBS.	=	$350.0K



ALL RESPONSES

NO. OBS.	=	14
MIN. OBS.	=	$ 0.5K
MAX. OBS.	=	$350.0K



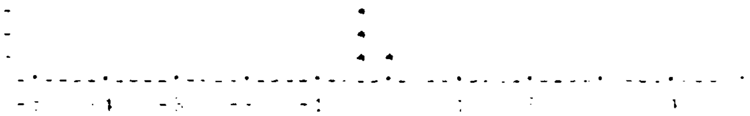
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $46.0K STD. DEV. = $90.8K

Q33 - COST PER YEAR FOR UPDATING DATA FILES -- SYSTEM 3 FOR NON-CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	\$23.8K
STD. DEV.	=	\$ 8.1K
MIN. OBS.	=	\$19.2K
MAX. OBS.	=	\$36.0K

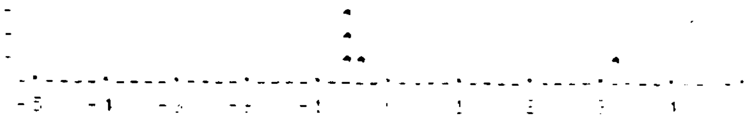


OTHER AEROSPACE

NO. OBS.	=	6
MEAN	=	\$39.8K
STD. DEV.	=	\$32.3K
MIN. OBS.	=	\$15.0K
MAX. OBS.	=	\$100.0K

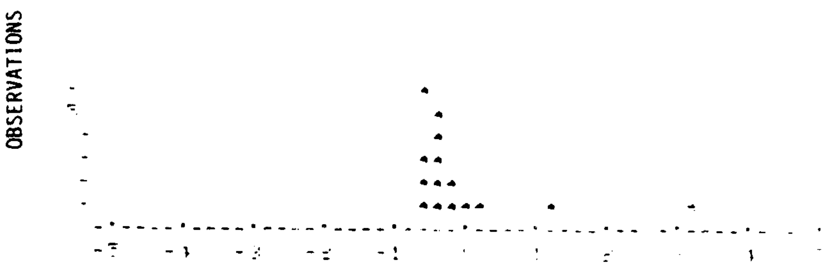
OTHER INDUSTRY

NO. OBS.	=	5
MEAN	=	\$49.3K
STD. DEV.	=	\$84.3K
MIN. OBS.	=	\$ 9.5K
MAX. OBS.	=	\$200.0K



ALL RESPONSES

NO. OBS.	=	15
MIN. OBS.	=	\$ 9.5K
MAX. OBS.	=	\$200.0K



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$38.7K STD. DEV. = \$50.2K

APPENDIX C

INTERMEDIATE DATA CALCULATIONS

This appendix contains some of the intermediate calculations which were made using the basic data contained in Appendix B.

The questionnaire was structured in such a manner as to facilitate the calculation of numerous values which would be useful in checking the validity of the data submitted and providing additional information for the benefit analysis. All of the intermediate calculations which were made are not contained in this appendix. Some turned out to be only marginally useful for the purposes of this report, and for the sake of brevity they are not included in this report.

As was the case in Appendix B, each of the intermediate calculations underwent computer analysis and the number of observations, means, standard deviations, etc., were calculated by industry grouping and for all responses. Histograms are also provided, and it should again be emphasized that scale zero point for horizontal axes for all plots on the same page is standard deviations from the mean for all responses and not individual subgroupings.

Each intermediate calculation has been given an appropriate title to indicate the meaning of the information. Space limitations and

terminology make it almost impossible to provide a detailed explanation of the basis for each calculation; however, a brief description of how some of the numbers were derived is discussed below.

One series of calculations dealt with determining such annual costs as the value of machined parts manufactured in-house, the amount expended for process planning, direct labor, material, tooling, etc. This was done using a top-down approach whereby the data at a very gross level could be linked together to come up with values for these parameters. Briefly, the caluclations were made in the following manner. The value of products shipped were multiplied by the percentage of that value which represented machines parts to determine the dollar value of machined parts. The value of machined parts purchased from outside sources was then substracted from that value to yield the approximate value of machined parts manufactured in-house. This number was then multiplied by the appropriate cost breakdown percentages provided by the respondees to end up with gross approximations of the annual dollars expended for process planning, etc.

Using a bottoms-up approach we were able to determine some of the same information from other data provided by the respondee and compare the two values.

In the case of process planning costs, these comparisons varied widely (see pages C-55 and C-56).

Other calculations included such information as:

- The percentage of process planning costs by type of plan.

- The ratio of new and modified process plans prepared to the number of different parts manufactured on an annual basis.

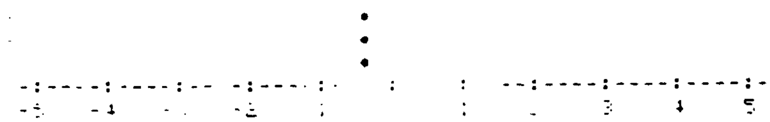
- The average dollar value of machined parts by industry type.

It should be noted that many of these calculations can only yield gross approximations to the values in question and that many of the responses varied widely. However, the calculations were beneficial in shedding light on the situation and were useful during the benefit analysis.

APPROXIMATE ANNUAL DOLLAR VALUE OF CYLINDRICAL MACHINE PARTS IN PRODUCTS SHIPPED FROM PLANT

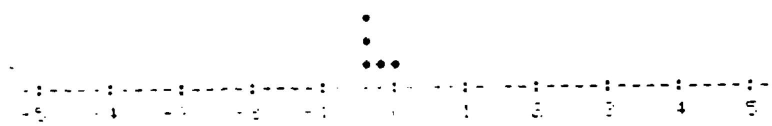
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = $6.0 MIL
STD. DEV. = $5.6 MIL
MIN. OBS. = $2.6 MIL
MAX. OBS. = $12,5 MIL



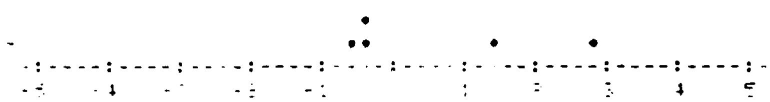
OTHER AEROSPACE

NO. OBS. = 5
MEAN = $20.0 MIL
STD. DEV. = $13.7 MIL
MIN. OBS. = $ 2.0 MIL
MAX. OBS. = $39.6 MIL



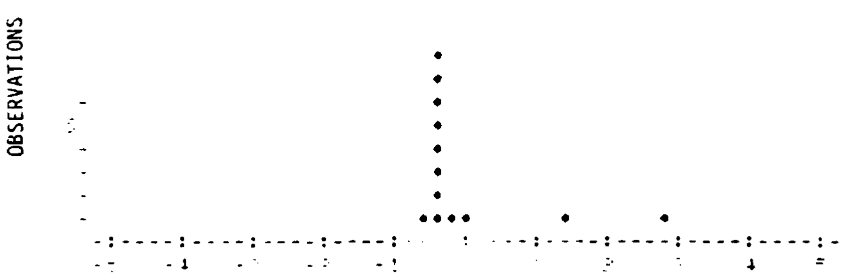
OTHER INDUSTRY

NO. OBS. = 5
MEAN = $102 MIL
STD. DEV. = $143 MIL
MIN. OBS. = $0.5 MIL
MAX. OBS. = $312 MIL



ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = $0.5 MIL
MAX. OBS. = $312 MIL

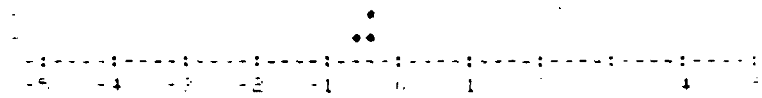


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $ 48 MIL STD. DEV. = $ 94 MIL

APPROXIMATE ANNUAL DOLLAR VALUE OF NON-CYLINDRICAL MACHINED PARTS IN PRODUCTS SHIPPED FROM PLANT

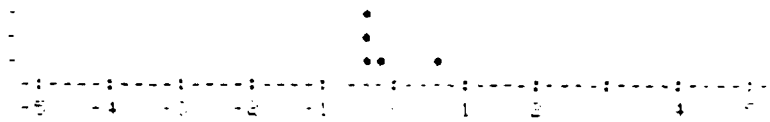
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = $5.3 mil.
STD. DEV. = $2.6 mil.
MIN. OBS. = $2.4 mil.
MAX. OBS. = $7.5 mil.



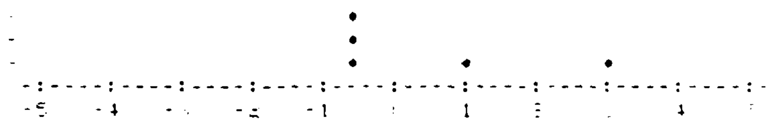
OTHER AEROSPACE

NO. OBS. = 5
MEAN = $22.6 mil.
STD. DEV. = $24.2 mil.
MIN. OBS. = $8.0 mil.
MAX. OBS. = $65 mil.



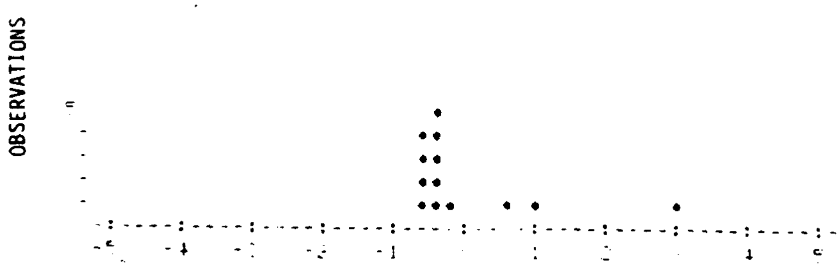
OTHER INDUSTRY

NO. OBS. = 5
MEAN = $54.7 mil.
STD. DEV. = $79.8 mil.
MIN. OBS. = $0.5 mil.
MAX. OBS. = $184 mil.



ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = $0.5 mil.
MAX. OBS. = $184 mil.

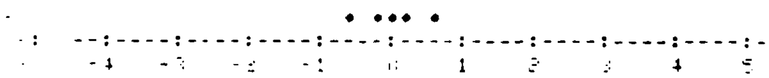


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $31.0 mil. STD. DEV. = $52.4 mil.

APPROXIMATE ANNUAL DOLLAR VOLUME OF CYLINDRICAL MACHINED PARTS MANUFACTURED IN-HOUSE

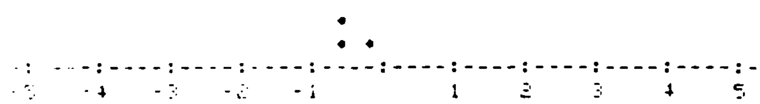
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = $4.0 mil.
STD. DEV. = $4.8 mil.
MIN. OBS. = $0.4 mil.
MAX. OBS. = $9.5 mil.



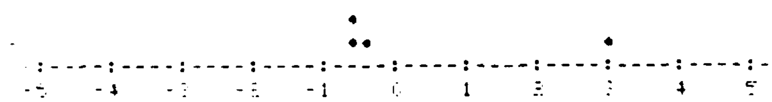
OTHER AEROSPACE

NO. OBS. = 5
MEAN = $18.6 mil.
STD. DEV. = $13.0 mil.
MIN. OBS. = $1.9 mil.
MAX. OBS. = $36.4 mil.



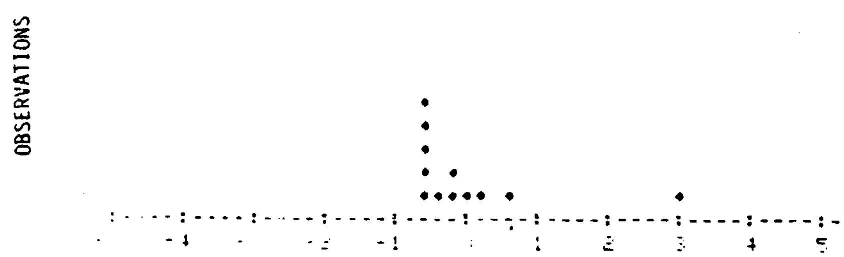
OTHER INDUSTRY

NO. OBS. = 4
MEAN = $30.3 mil.
STD. DEV. = $57.8 mil.
MIN. OBS. = $0.4 mil.
MAX. OBS. = $117 mil.



ALL RESPONSES

NO. OBS. = 12
MIN. OBS. = $0.4 mil.
MAX. OBS. = $117 mil.

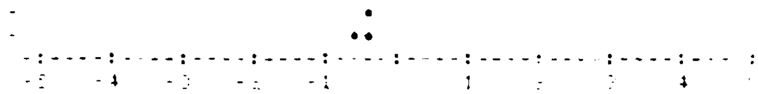


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $18.9 mil.   STD. DEV. = $32.9 mil.

APPROXIMATE ANNUAL DOLLAR VOLUME OF NON-CYLINDRICAL MACHINED PARTS MANUFACTURED IN-HOUSE

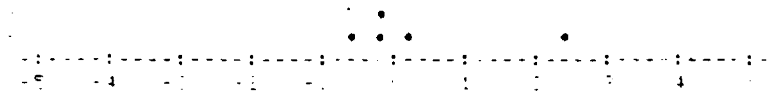
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = $3.8 mil.
STD. DEV. = $3.2 mil.
MIN. OBS. = $0.3 mil.
MAX. OBS. = $6.5 mil.



OTHER AEROSPACE

NO. OBS. = 5
MEAN = $20.7 mil.
STD. DEV. = $25.0 mil.
MIN. OBS. = $2.0 mil.
MAX. OBS. = $64.4 mil.

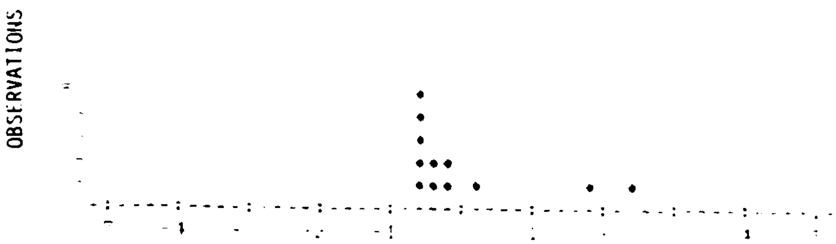


OTHER INDUSTRY

NO. OBS. = 4
MEAN = $14.1 mil.
STD. DEV. = $23.9 mil.
MIN. OBS. = $0.4 mil.
MAX. OBS. = $50.0 mil.

ALL RESPONSES

NO. OBS. = 12
MIN. OBS. = $0.3 mil.
MAX. OBS. = $64.4 mil.

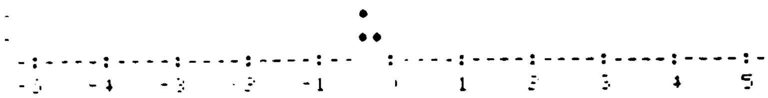


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $14.3 mil. STD. DEV. = $20.9 mil.

APPROXIMATE DOLLAR VALUE OF A CYLINDRICAL MACHINED PART MANUFACTURED IN-HOUSE

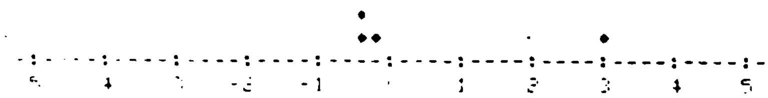
MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	$1068
STD. DEV.	=	$1817
MIN. OBS.	=	$7.5
MAX. OBS.	=	$3166



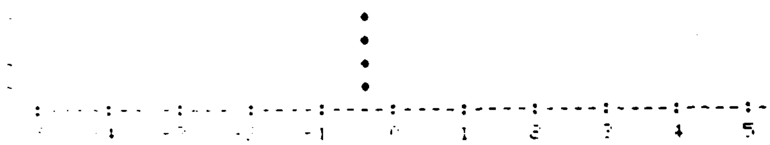
OTHER AEROSPACE

NO. OBS.	=	4
MEAN	=	$14725
STD. DEV.	=	$29029
MIN. OBS.	=	$4.8
MAX. OBS.	=	$58266



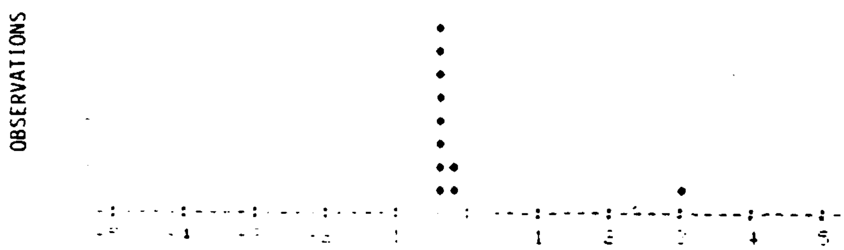
OTHER INDUSTRY

NO. OBS.	=	4
MEAN	=	$159
STD. DEV.	=	$197
MIN. OBS.	=	$14.4
MAX. OBS.	=	$450



ALL RESPONSES

NO. OBS.	=	11
MIN. OBS.	=	$4.8
MAX. OBS.	=	$58266



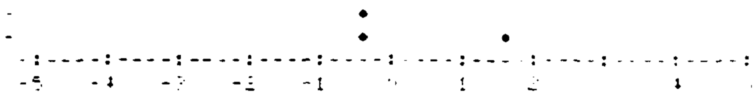
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $5704 STD. DEV. = $17458

APPROXIMATE DOLLAR VALUE OF A NON-CYLINDRICAL MACHINED PART MANUFACTURED IN-HOUSE

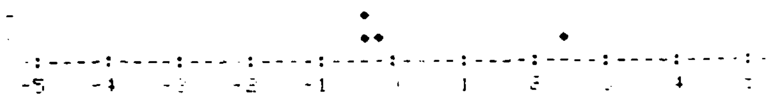
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = $2174
STD. DEV. = $3747
MIN. OBS. = $7.5
MAX. OBS. = $6500



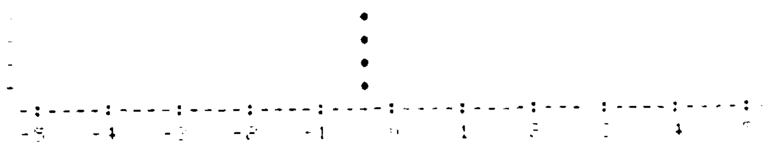
OTHER AEROSPACE

NO. OBS. = 4
MEAN = $2318
STD. DEV. = $4190
MIN. OBS. = $8.7
MAX. OBS. = $8586



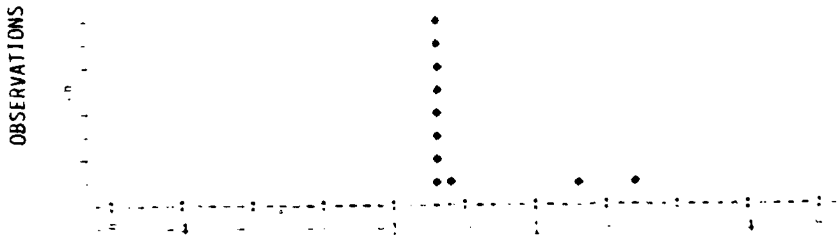
OTHER INDUSTRY

NO. OBS. = 4
MEAN = $73
STD. DEV. = $56
MIN. OBS. = $9.4
MAX. OBS. = $128



ALL RESPONSES

NO. OBS. = 11
MIN. OBS. = $7.5
MAX. OBS. = $8586

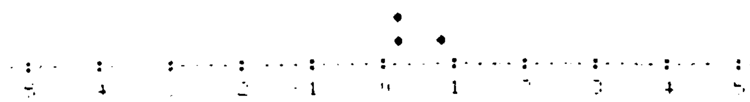


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $1462 STD. DEV. = $3048

VALIDITY CHECK BETWEEN NUMBER OF NEW PART NUMBERS INDICATED IN Q7 AND NUMBER OF PROCESS PLANS PREPARED FOR NEW PARTS AS INDICATED IN Q13 -- CYLINDRICAL PARTS (Q7-Q13)

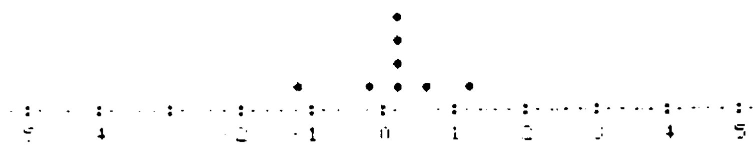
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 50
STD. DEV. = 87
MIN. OBS. = 0
MAX. OBS. = 150



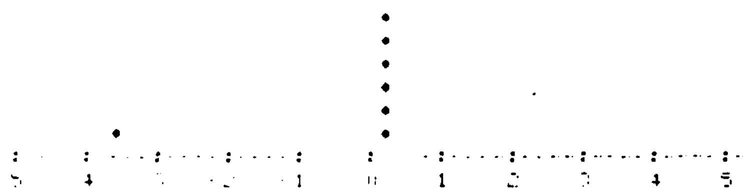
OTHER AEROSPACE

NO. OBS. = 8
MEAN = -14.4
STD. DEV. = 194
MIN. OBS. = -400
MAX. OBS. = 290



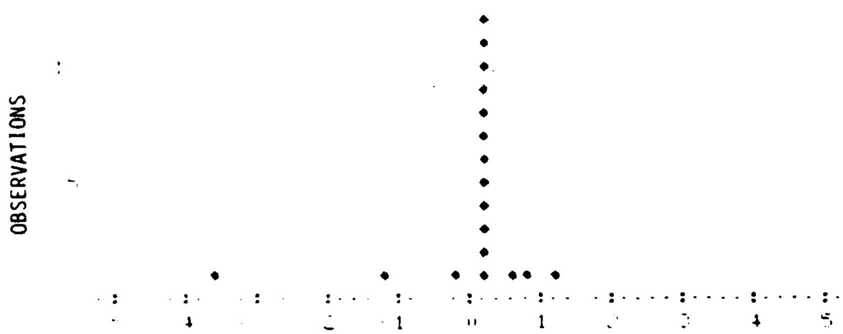
OTHER INDUSTRY

NO. OBS. = 7
MEAN = -143
STD. DEV. = 378
MIN. OBS. = -1000
MAX. OBS. = 0



ALL RESPONSES

NO. OBS. = 18
MIN. OBS. = -1000
MAX. OBS. = 290

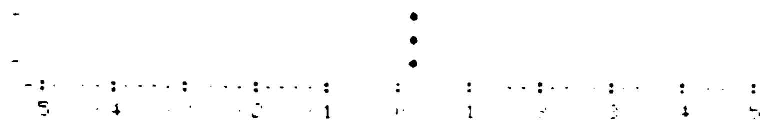


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = -53.6 STD. DEV. = 270

DITY CHECK BETWEEN NUMBER OF NEW PART NUMBERS INDICATED IN Q7 AND NUMBER OF PROCESS PLANS
ARED FOR NEW PARTS AS INDICATED IN Q13 -- NON-CYLINDRICAL PARTS (Q7-Q13)

ILE PRIMES & SUBS

OBS. = 3
I = 8.3
DEV. = 14.4
OBS. = 0
OBS. = 25

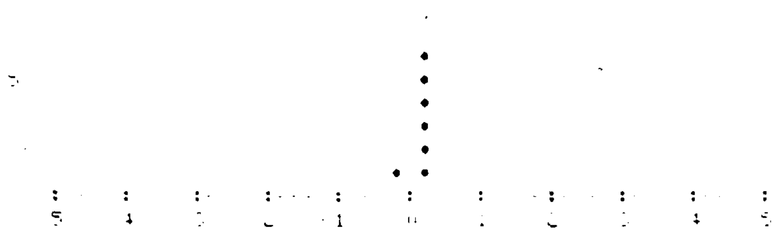


ER AEROSPACE

OBS. = 8
N = -32.5
. DEV. = 234
. OBS. = -500
. OBS. = 285

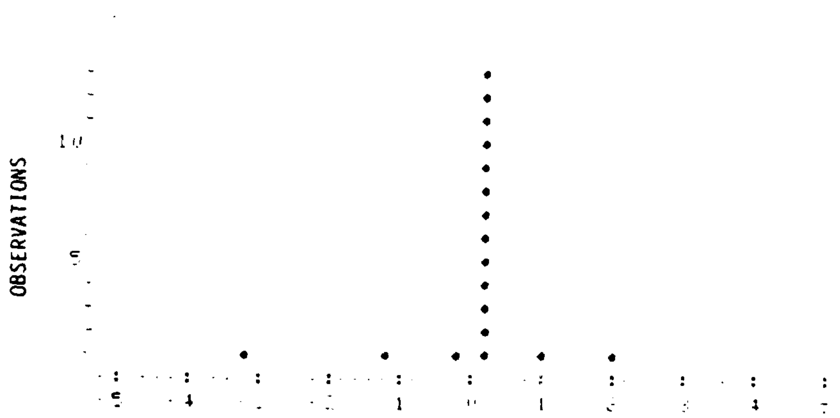
ER INDUSTRY

OBS. = 7
N = -5.7
. DEV. = 15.1
. OBS. = -40
. OBS. = 0



. RESPONSES

OBS. = 18
I. OBS. = -500
(. OBS. = 285

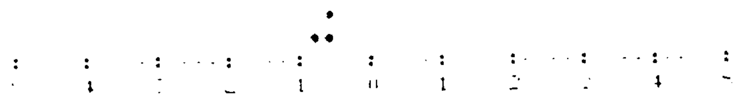


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = -15.3 STD. DEV. = 151

?PROXIMATE ANNUAL COST FOR PREPARING TOTALLY NEW PROCESS PLANS FOR CYLINDRICAL MACHINED PARTS

ISSILE PRIMES & SUBS

0. OBS. = 3
EAN = $ 32.3K
TD. DEV. = $ 13.6K
IN. OBS. = $ 24K
AX. OBS. = $ 48K



THER AEROSPACE

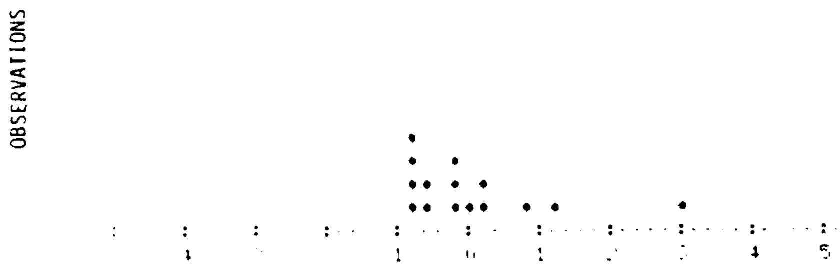
0. OBS. = 5
EAN = $ 135K
TD. DEV. = $ 106K
IN. OBS. = $ 12K
AX. OBS. = $ 300K

THER INDUSTRY

0. OBS. = 7
EAN = $ 158K
TD. DEV. = $ 187K
IN. OBS. = $ 1.8K
AX. OBS. = $ 544K

LL RESPONSES

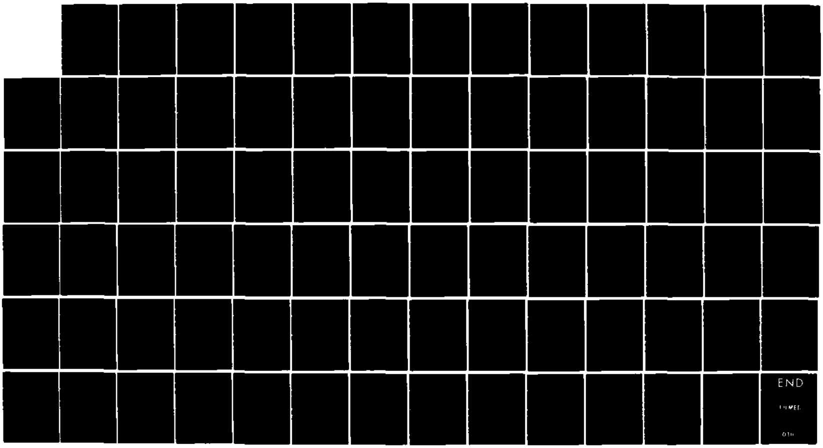
0. OBS. = 15
IN. OBS. = $ 1.8K
AX. OBS. = $ 544K

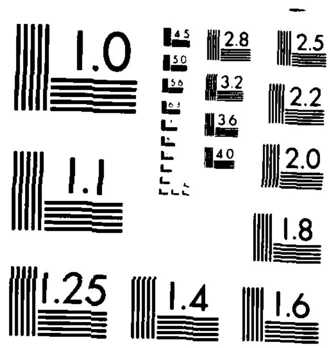


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $125K STD. DEV. = $144K

AD-A151 997 COMPUTERIZED PRODUCTION PROCESS PLANNING VOLUME 3 4/4
APPENDICES A B AND C TO BENEFIT ANALYSIS(U) IIT
RESEARCH INST CHICAGO IL H H SHU ET AL. NOV 76
UNCLASSIFIED DAAH01-76-C-1104 F/G 9/2 NL




1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0

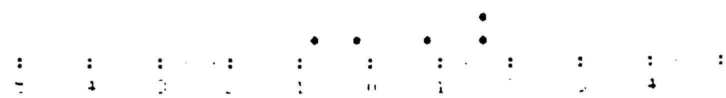
APPROXIMATE ANNUAL COST FOR PREPARING TOTALLY NEW PROCESS PLANS FOR NON-CYLINDRICAL MACHINED PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = $ 65.7K
STD. DEV. = $ 33.3K
MIN. OBS. = $ 30K
MAX. OBS. = $ 96K

OTHER AEROSPACE

NO. OBS. = 5
MEAN = $ 185K
STD. DEV. = $ 121K
MIN. OBS. = $ 30K
MAX. OBS. = $ 300K

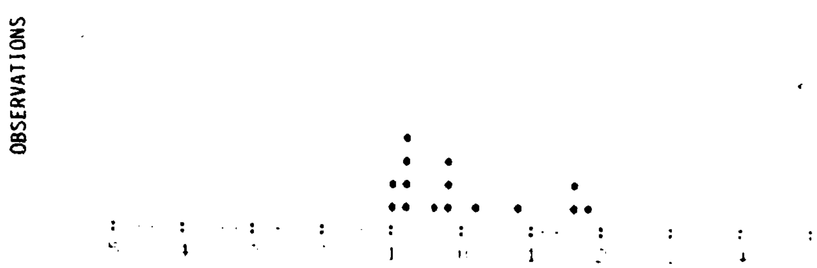


OTHER INDUSTRY

NO. OBS. = 7
MEAN = $ 85.5K
STD. DEV. = $ 116K
MIN. OBS. = $ 0.3K
MAX. OBS. = $ 325K

ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = $ 0.3K
MAX. OBS. = $ 325K



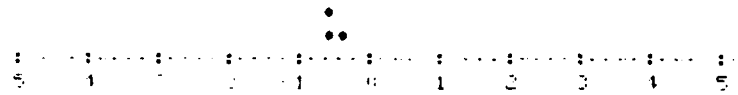
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $ 115K STD. DEV. = $113K

APPROXIMATE ANNUAL COST FOR MODIFYING PROCESS PLANS FOR CYLINDRICAL MACHINED PARTS

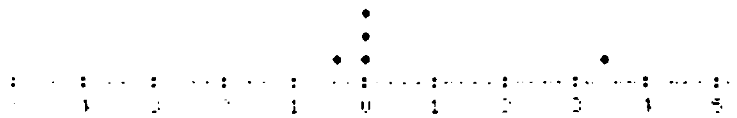
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = $ 8.9K
STD. DEV. = $ 9.6K
MIN. OBS. = $ 0.4K
MAX. OBS. = $19.2K



OTHER AEROSPACE

NO. OBS. = 5
MEAN = $ 181K
STD. DEV. = $ 253K
MIN. OBS. = $12.0K
MAX. OBS. = $ 630K

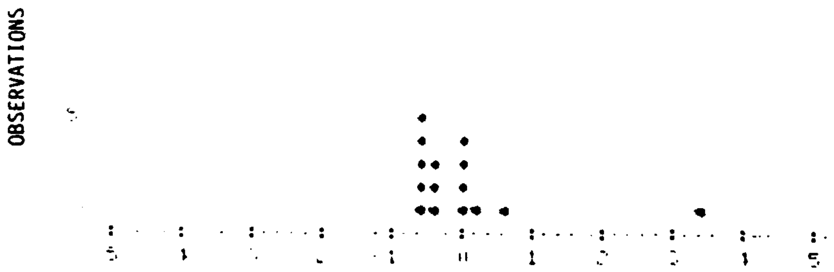


OTHER INDUSTRY

NO. OBS. = 7
MEAN = $ 57.9K
STD. DEV. = $ 69.7K
MIN. OBS. = $ 0.8 K
MAX. OBS. = $ 175 K

ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = $ 0.4K
MAX. OBS. = $ 630K

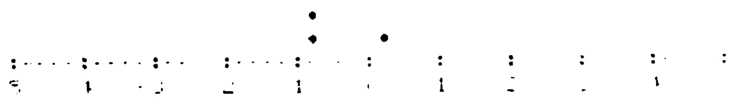


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $89.3K STD. DEV. = $159K

APPROXIMATE ANNUAL COST FOR MODIFYING PROCESS PLANS FOR NON-CYLINDRICAL MACHINED PARTS

MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	$ 40K
STD. DEV.	=	$ 58K
MIN. OBS.	=	$ 0.7K
MAX. OBS.	=	$ 106K



OTHER AEROSPACE

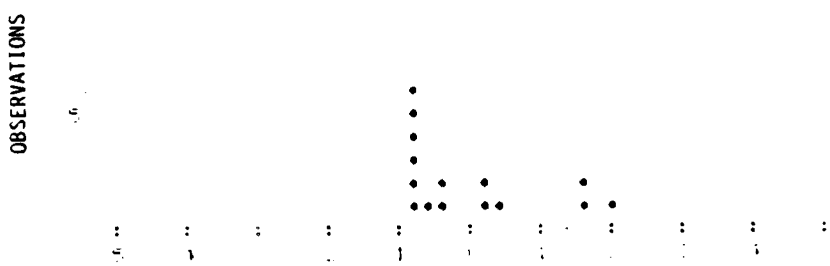
NO. OBS.	=	5
MEAN	=	$ 194K
STD. DEV.	=	$ 104K
MIN. OBS.	=	$ 50K
MAX. OBS.	=	$ 297K

OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	$ 28K
STD. DEV.	=	$ 37K
MIN. OBS.	=	$ 0.6K
MAX. OBS.	=	$105K

ALL RESPONSES

NO. OBS.	=	15
MIN. OBS.	=	$ 0.6K
MAX. OBS.	=	$297K



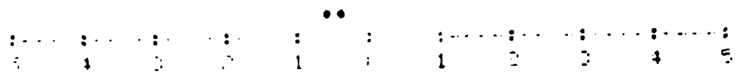
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $ 86K STD. DEV. = $102K

APPROXIMATE ANNUAL COSTS FOR PREPARING STUDY PLANS FOR CYLINDRICAL MACHINED PARTS

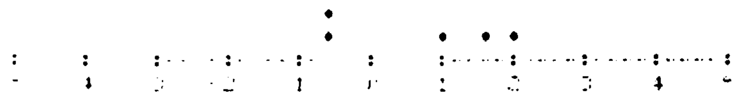
MISSILE PRIMES & SUBS

NO. OBS.	=	2
MEAN	=	$ 16K
STD. DEV.	=	$ 13K
MIN. OBS.	=	$ 7K
MAX. OBS.	=	$ 25K



OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	$ 81K
STD. DEV.	=	$ 74K
MIN. OBS.	=	$ 3K
MAX. OBS.	=	$160K



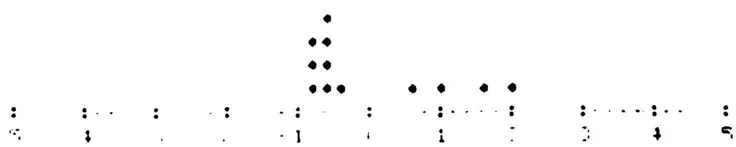
OTHER INDUSTRY

NO. OBS.	=	5
MEAN	=	$ 18K
STD. DEV.	=	$ 37K
MIN. OBS.	=	$ 0
MAX. OBS.	=	$ 84K

OBSERVATIONS

ALL RESPONSES

NO. OBS.	=	12
MIN. OBS.	=	$ 0
MAX. OBS.	=	$ 160K



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $ 44K   STD. DEV. = $ 60K

APPROXIMATE ANNUAL COSTS FOR PREPARING STUDY PLANS FOR NON-CYLINDRICAL MACHINED PARTS

MISSILE PRIMES & SUBS

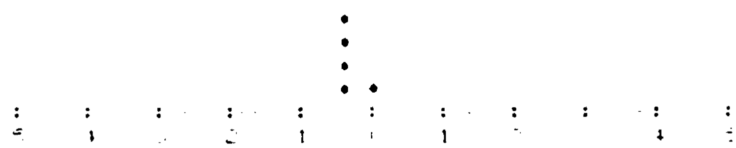
NO. OBS.	=	2
MEAN	=	$ 27K
STD. DEV.	=	$ 18K
MIN. OBS.	=	$ 14K
MAX. OBS.	=	$ 40K

OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	$ 148K
STD. DEV.	=	$ 230K
MIN. OBS.	=	$ 0.5K
MAX. OBS.	=	$ 555K

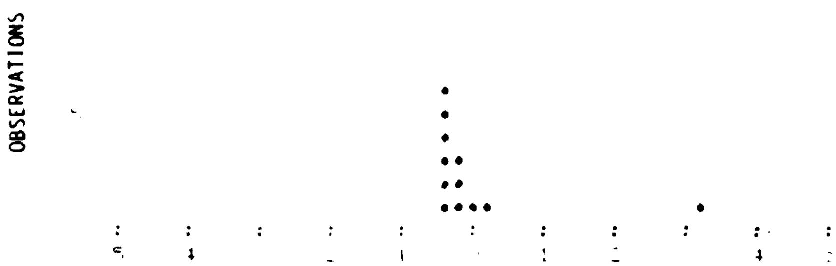
OTHER INDUSTRY

NO. OBS.	=	5
MEAN	=	$ 13K
STD. DEV.	=	$ 24K
MIN. OBS.	=	$ 0
MAX. OBS.	=	$ 56K



ALL RESPONSES

NO. OBS.	=	12
MIN. OBS.	=	$ 0
MAX. OBS.	=	$ 555K



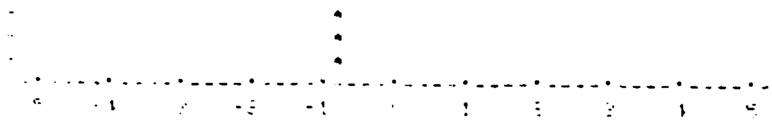
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $ 71K STD. DEV. = $ 155K

APPROXIMATE ANNUAL PROCESS PLANNING COSTS FOR CYLINDRICAL MACHINED PARTS

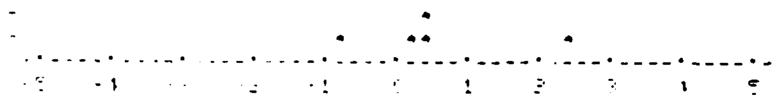
MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	$ 52K
STD. DEV.	=	$ 8K
MIN. OBS.	=	$ 43K
MAX. OBS.	=	$ 57K



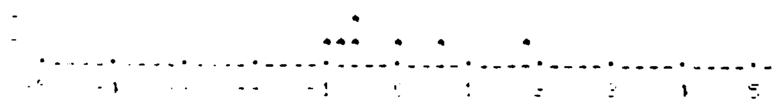
OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	$ 397K
STD. DEV.	=	$ 307K
MIN. OBS.	=	$ 28K
MAX. OBS.	=	$ 880K



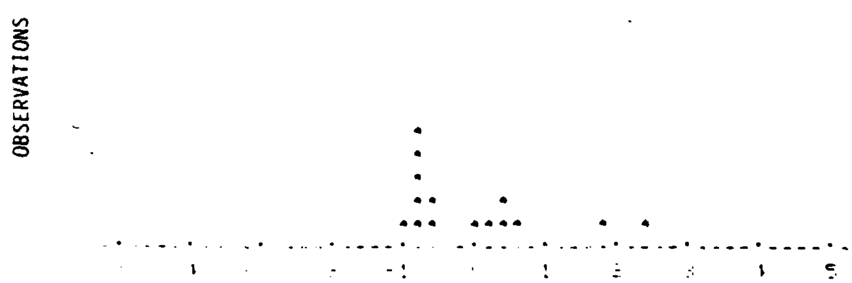
OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	$ 229K
STD. DEV.	=	$ 261K
MIN. OBS.	=	$ 3K
MAX. OBS.	=	$ 724K



ALL RESPONSES

NO. OBS.	=	15
MIN. OBS.	=	$ 3K
MAX. OBS.	=	$ 880K



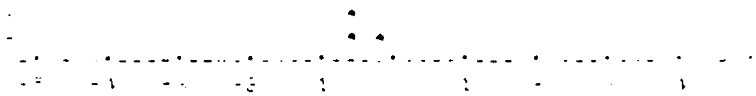
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $ 250K STD. DEV. = $ 296K

APPROXIMATE ANNUAL PROCESS PLANNING COSTS FOR NON-CYLINDRICAL MACHINED PARTS

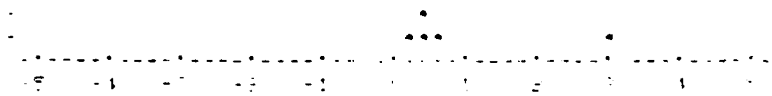
MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	$ 124K
STD. DEV.	=	$ 48K
MIN. OBS.	=	$ 83K
MAX. OBS.	=	$ 178K



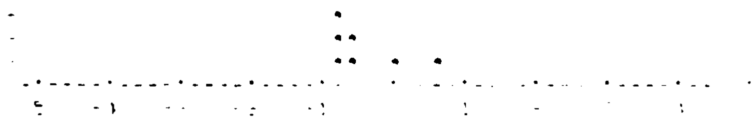
OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	$ 527K
STD. DEV.	=	$ 350K
MIN. OBS.	=	$ 305K
MAX. OBS.	=	$1146K



OTHER INDUSTRY

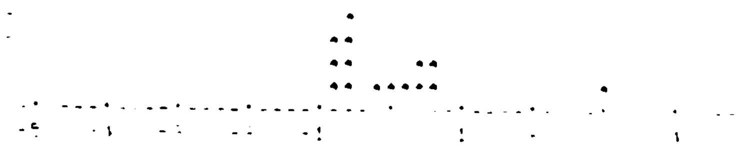
NO. OBS.	=	7
MEAN	=	$ 123K
STD. DEV.	=	$ 158K
MIN. OBS.	=	$ 3K
MAX. OBS.	=	$ 432K



ALL RESPONSES

NO. OBS.	=	15
MIN. OBS.	=	$ 3K
MAX. OBS.	=	$ 1146K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $ 258K STD. DEV. = $ 291K

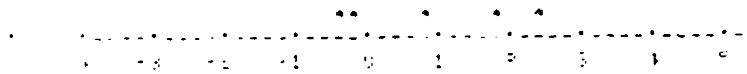
APPROXIMATE AVERAGE COST PER PROCESS PLAN PREPARED FOR CYLINDRICAL MACHINED PARTS

<u>MISSILE PRIMES & SUBS</u>

NO. OBS.	=	3
MEAN	=	$182
STD. DEV.	=	$ 65
MIN. OBS.	=	$136
MAX. OBS.	=	$257

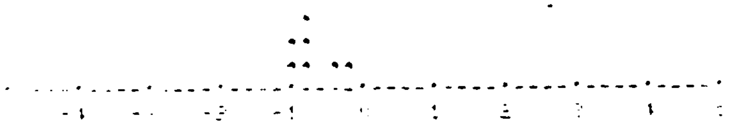
<u>OTHER AEROSPACE</u>

NO. OBS.	=	5
MEAN	=	$326
STD. DEV.	=	$197
MIN. OBS.	=	$116
MAX. OBS.	=	$580



<u>OTHER INDUSTRY</u>

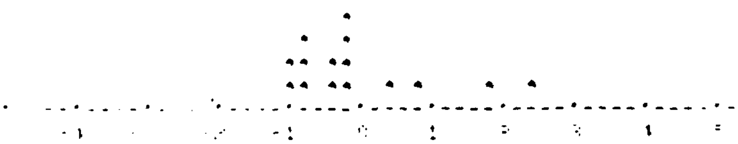
NO. OBS.	=	7
MEAN	=	$ 64
STD. DEV.	=	$ 50
MIN. OBS.	=	$ 17
MAX. OBS.	=	$156



<u>ALL RESPONSES</u>

NO. OBS.	=	15
MIN. OBS.	=	$ 17
MAX. OBS.	=	$580

OBSERVATIONS



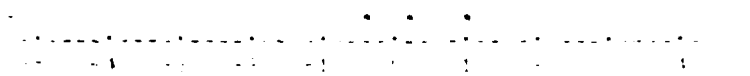
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $175 STD. DEV. = $165

APPROXIMATE AVERAGE COST PER PROCESS PLAN PREPARED FOR NON-CYLINDRICAL MACHINED PARTS

MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	$252
STD. DEV.	=	$125
MIN. OBS.	=	$136
MAX. OBS.	=	$384

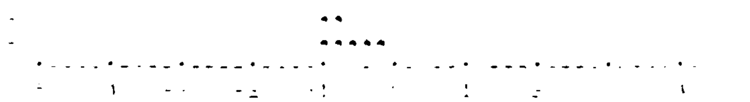


OTHER AEROSPACE

NO. OBS.	=	5
MEAN	=	$352
STD. DEV.	=	$202
MIN. OBS.	=	$145
MAX. OBS.	=	$599

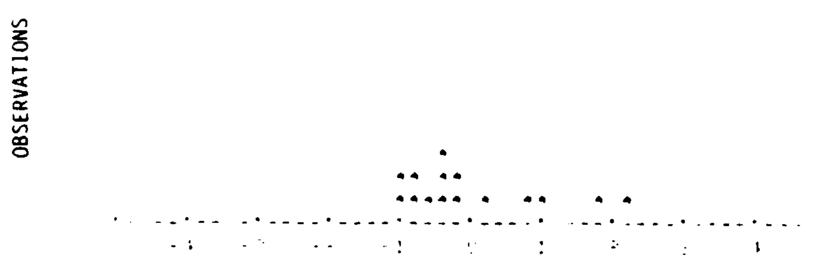
OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	$ 87
STD. DEV.	=	$ 60
MIN. OBS.	=	$ 23
MAX. OBS.	=	$175



ALL RESPONSES

NO. OBS.	=	15
MIN. OBS.	=	$ 23
MAX. OBS.	=	$599



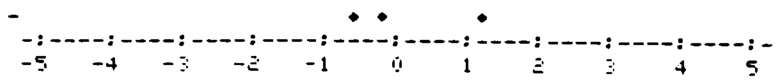
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $208 STD. DEV. = $175

APPROPRIATE PERCENTAGE OF PROCESS PLANNING COSTS ATTRIBUTABLE TO PREPARING PLANS FOR NEW CYLINDRICAL PARTS

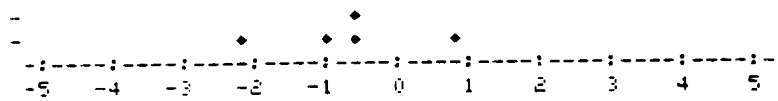
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 62.0%
STD. DEV. = 21.0%
MIN. OBS. = 43.9%
MAX. OBS. = 86.4%



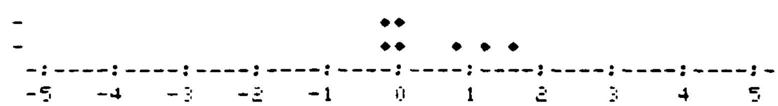
OTHER AEROSPACE

NO. OBS. = 5
MEAN = 41.9%
STD. DEV. = 24.5%
MIN. OBS. = 10.2%
MAX. OBS. = 78.3%



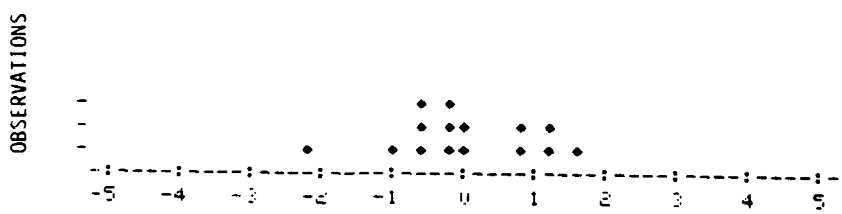
OTHER INDUSTRY

NO. OBS. = 7
MEAN = 69.2%
STD. DEV. = 16.5%
MIN. OBS. = 53.8%
MAX. OBS. = 94.3%



ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = 10.2%
MAX. OBS. = 94.3%

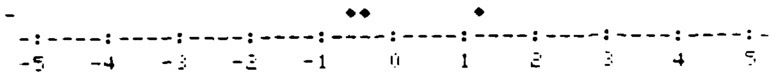


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 58.6% STD. DEV. = 22.7%

APPROPRIATE PERCENTAGE OF PROCESS PLANNING COSTS ATTRIBUTABLE TO PREPARING PLANS FOR NEW NON-CYLINDRICAL PARTS

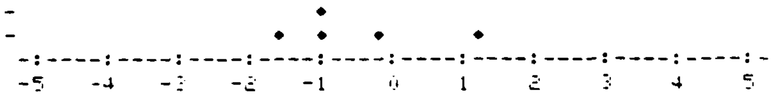
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 54.2%
STD. DEV. = 28.0%
MIN. OBS. = 31.1%
MAX. OBS. = 86.4%



OTHER AEROSPACE

NO. OBS. = 5
MEAN = 38.5%
STD. DEV. = 29.9%
MIN. OBS. = 9.8%
MAX. OBS. = 85.6%

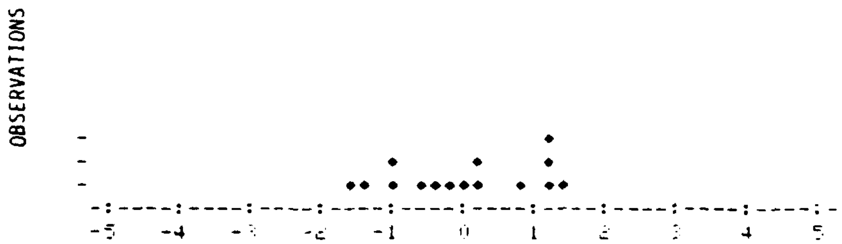


OTHER INDUSTRY

NO. OBS. = 7
MEAN = 62.5%
STD. DEV. = 27.1%
MIN. OBS. = 11.8%
MAX. OBS. = 94.3%

ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = 9.8%
MAX. OBS. = 94.3%

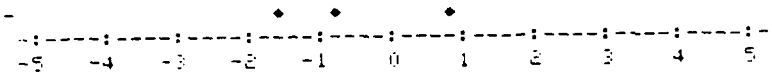


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 52.8% STD. DEV. = 28.3%

APPROXIMATE PERCENTAGE OF PROCESS PLANNING COSTS ATTRIBUTABLE TO MODIFYING EXISTING PLANS FOR CYLINDRICAL PARTS

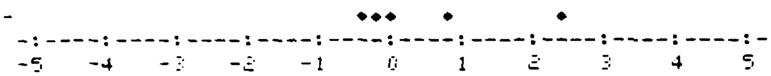
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 19.1%
STD. DEV. = 22.7%
MIN. OBS. = 0.6%
MAX. OBS. = 44.4%



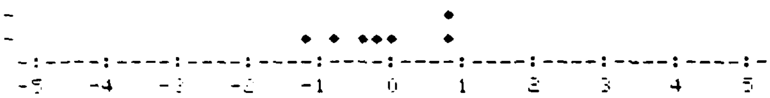
OTHER AEROSPACE

NO. OBS. = 5
MEAN = 37.7%
STD. DEV. = 20.7%
MIN. OBS. = 20.9%
MAX. OBS. = 71.6%



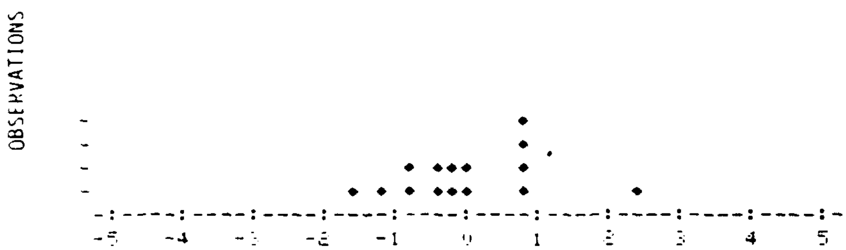
OTHER INDUSTRY

NO. OBS. = 7
MEAN = 25.7%
STD. DEV. = 14.3%
MIN. OBS. = 5.7%
MAX. OBS. = 43.3%



ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = 0.6%
MAX. OBS. = 71.6%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 28.4% STD. DEV. = 18.3%

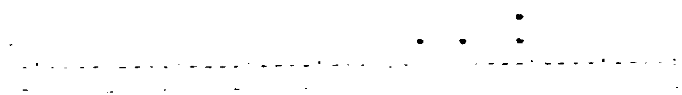
APPROXIMATE RATIO OF NEW PLUS MODIFIED PLANS PREPARED ANNUALLY FOR CYLINDRICAL PARTS TO NUMBER OF CYLINDRICAL PARTS PRODUCED ANNUALLY (BY PART NUMBER, NOT TOTAL VOLUME)

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 0.411
STD. DEV. = 0.242
MIN. OBS. = 0.140
MAX. OBS. = 0.605

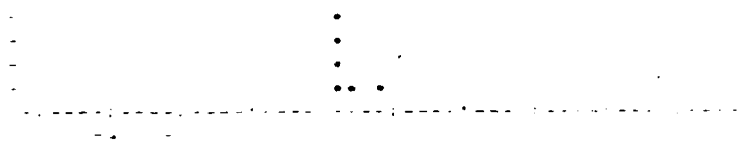
OTHER AEROSPACE

NO. OBS. = 4
MEAN = 1.440
STD. DEV. = 0.407
MIN. OBS. = 0.929
MAX. OBS. = 1.805



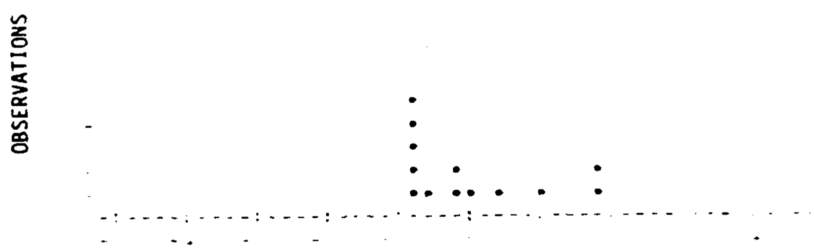
OTHER INDUSTRY

NO. OBS. = 6
MEAN = 0.224
STD. DEV. = 0.150
MIN. OBS. = 0.110
MAX. OBS. = 0.500



ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = 0.110
MAX. OBS. = 1.805



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 0.641 STD. DEV. = 0.616

APPROXIMATE RATIO OF MODIFIED PROCESS PLANS PREPARED ANNUALLY FOR NON-CYLINDRICAL PARTS TO NUMBER OF NON-CYLINDRICAL PARTS PRODUCED ANNUALLY (BY PART NUMBER, NOT TOTAL VOLUME)

MISSILE PRIMES & SUBS

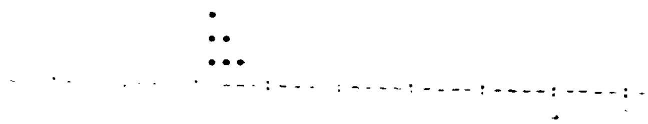
NO. OBS. = 3
MEAN = 0.395
STD. DEV. = 0.533
MIN. OBS. = 0.007
MAX. OBS. = 1.003

OTHER AEROSPACE

NO. OBS. = 4
MEAN = 0.909
STD. DEV. = 0.535
MIN. OBS. = 0.286
MAX. OBS. = 1.591

OTHER INDUSTRY

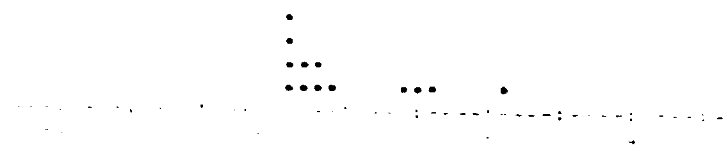
NO. OBS. = 6
MEAN = 0.008
STD. DEV. = 0.007
MIN. OBS. = 0.023
MAX. OBS. = 0.211



OBSERVATIONS

ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = 0.007
MAX. OBS. = 1.591

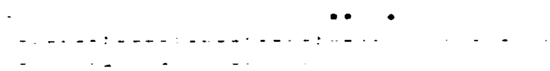


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 0.406 STD. DEV. = 0.516

APPROXIMATE RATIO OF MODIFIED PROCESS PLANS PREPARED ANNUALLY FOR CYLINDRICAL PARTS TO NUMBER OF CYLINDRICAL PARTS PRODUCED ANNUALLY (BY PART NUMBER, NOT TOTAL VOLUME)

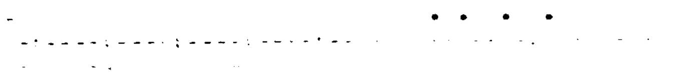
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 0.181
STD. DEV. = 0.202
MIN. OBS. = 0.007
MAX. OBS. = 0.403



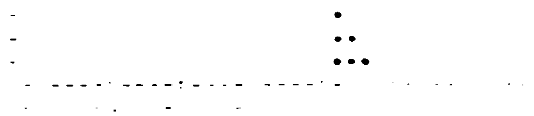
OTHER AEROSPACE

NO. OBS. = 4
MEAN = 1.156
STD. DEV. = 0.381
MIN. OBS. = 0.714
MAX. OBS. = 1.593



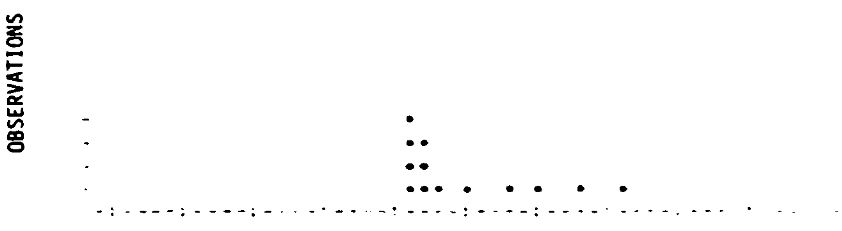
OTHER INDUSTRY

NO. OBS. = 6
MEAN = 0.076
STD. DEV. = 0.054
MIN. OBS. = 0.024
MAX. OBS. = 0.167



ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = 0.007
MAX. OBS. = 1.593



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 0.432 STD. DEV. = 0.549

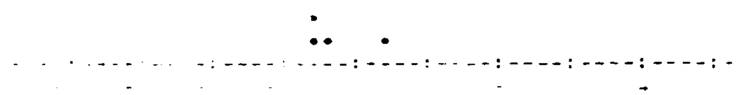
APPROXIMATE RATIO OF PROCESS PLANS FOR NEW NON-CYLINDRICAL PARTS TO NUMBER OF NON-CYLINDRICAL PARTS PRODUCED ANNUALLY (BY PART NUMBERS, NOT TOTAL VOLUME)

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 0.260
STD. DEV. = 0.164
MIN. OBS. = 0.133
MAX. OBS. = 0.445

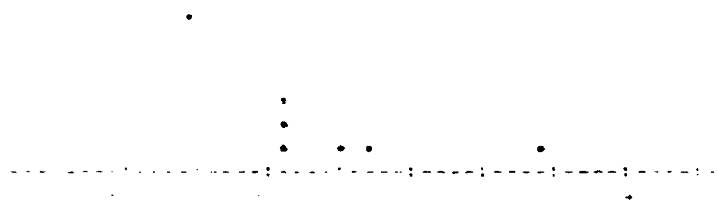
OTHER AEROSPACE

NO. OBS. = 4
MEAN = 0.152
STD. DEV. = 0.108
MIN. OBS. = 0.081
MAX. OBS. = 0.313



OTHER INDUSTRY

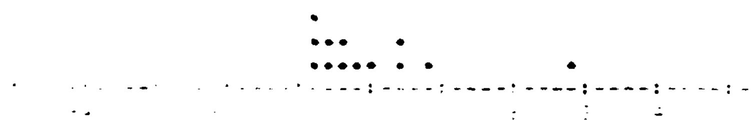
NO. OBS. = 6
MEAN = 0.271
STD. DEV. = 0.346
MIN. OBS. = 0.027
MAX. OBS. = 0.929



ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = 0.027
MAX. OBS. = 0.929

OBSERVATIONS

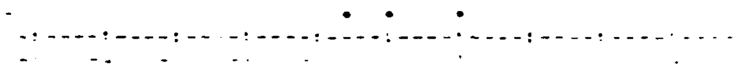


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 0.232 STD. DEV. = 0.246

APPROXIMATE RATIO OF PROCESS PLANS FOR NEW CYLINDRICAL PARTS TO NUMBER OF CYLINDRICAL PARTS PRODUCED ANNUALLY (BY PART NUMBERS, NOT TOTAL VOLUME)

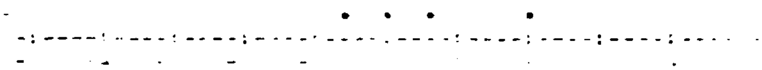
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 0.231
STD. DEV. = 0.115
MIN. OBS. = 0.133
MAX. OBS. = 0.358



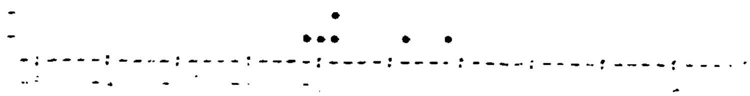
OTHER AEROSPACE

NO. OBS. = 4
MEAN = 0.284
STD. DEV. = 0.152
MIN. OBS. = 0.133
MAX. OBS. = 0.488



OTHER INDUSTRY

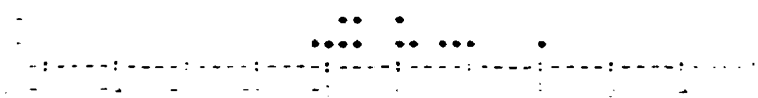
NO. OBS. = 6
MEAN = 0.148
STD. DEV. = 0.115
MIN. OBS. = 0.050
MAX. OBS. = 0.333



OBSERVATIONS

ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = 0.050
MAX. OBS. = 0.488

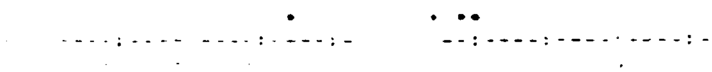


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 0.209 STD. DEV. = 0.141

APPROXIMATE RATIO OF PROCESS PLANS FOR STUDY PURPOSES FOR NON-CYLINDRICAL PARTS TO TOTAL NUMBER OF PROCESS PLANS OF ALL TYPES PREPARED ANNUALLY FOR NON-CYLINDRICAL PARTS

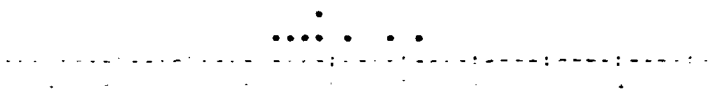
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 0.436
STD. DEV. = 0.244
MIN. OBS. = 0.078
MAX. OBS. = 0.607



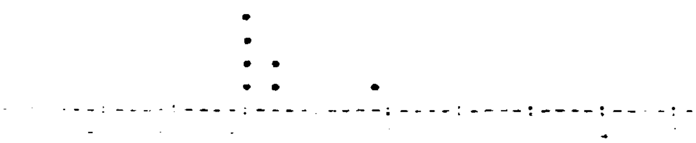
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 0.206
STD. DEV. = 0.151
MIN. OBS. = 0.017
MAX. OBS. = 0.471



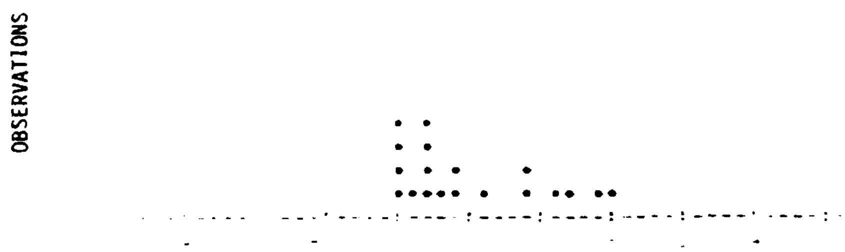
OTHER INDUSTRY

NO. OBS. = 7
MEAN = 0.071
STD. DEV. = 0.133
MIN. OBS. = 0.000
MAX. OBS. = 0.367



ALL RESPONSES

NO. OBS. = 19
MIN. OBS. = 0.000
MAX. OBS. = 0.607



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 0.205 STD. DEV. = 0.209

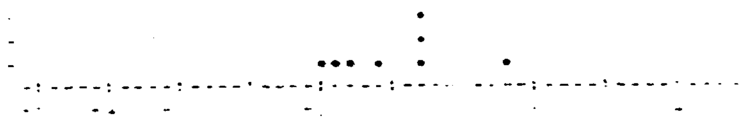
APPROXIMATE RATIO OF PROCESS PLANS FOR STUDY PURPOSES FOR CYLINDRICAL PARTS TO TOTAL NUMBER OF PROCESS PLANS OF ALL TYPES PREPARED ANNUALLY FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 0.447
STD. DEV. = 0.210
MIN. OBS. = 0.143
MAX. OBS. = 0.617

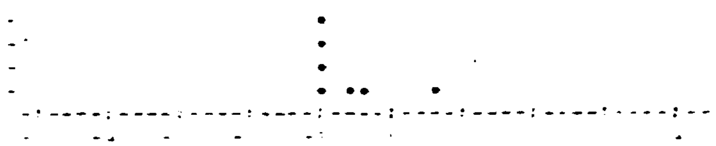
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 0.218
STD. DEV. = 0.187
MIN. OBS. = 0.015
MAX. OBS. = 0.572



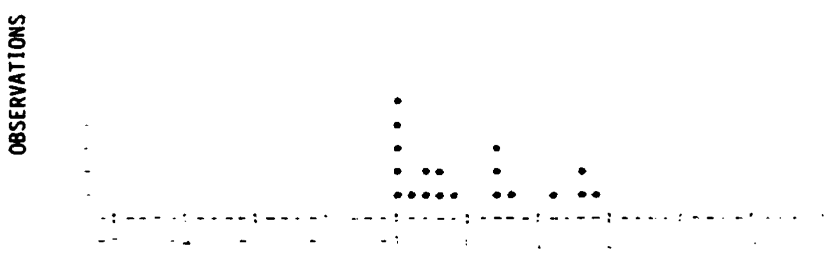
OTHER INDUSTRY

NO. OBS. = 7
MEAN = 0.073
STD. DEV. = 0.120
MIN. OBS. = 0.000
MAX. OBS. = 0.326



ALL RESPONSES

NO. OBS. = 19
MIN. OBS. = 0.000
MAX. OBS. = 0.617

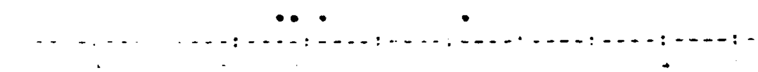


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 0.213 STD. DEV. = 0.215

APPROXIMATE RATIO OF PROCESS PLANS MODIFIED FOR NON-CYLINDRICAL PARTS TO TOTAL NUMBER OF PROCESS PLANS OF ALL TYPES PREPARED ANNUALLY FOR NON-CYLINDRICAL PARTS.

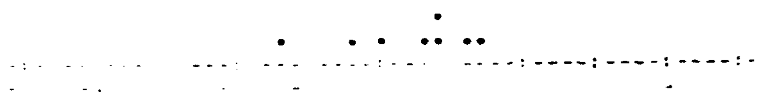
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 0.279
STD. DEV. = 0.335
MIN. OBS. = 0.024
MAX. OBS. = 0.768



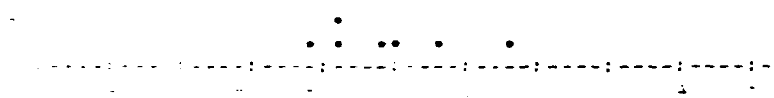
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 0.564
STD. DEV. = 0.263
MIN. OBS. = 0.058
MAX. OBS. = 0.855



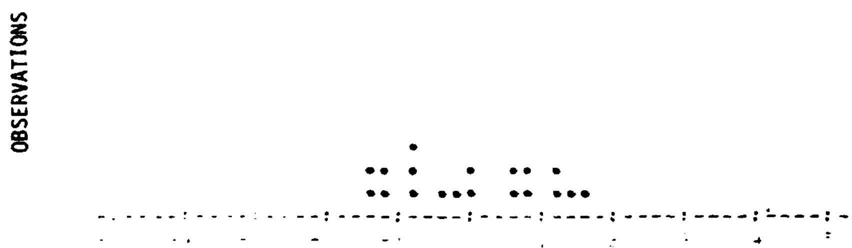
OTHER INDUSTRY

NO. OBS. = 7
MEAN = 0.416
STD. DEV. = 0.274
MIN. OBS. = 0.130
MAX. OBS. = 0.900



ALL RESPONSES

NO. OBS. = 19
MIN. OBS. = 0.024
MAX. OBS. = 0.900

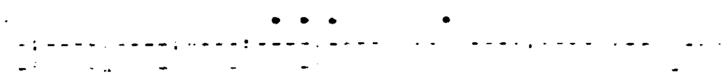


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 0.449 STD. DEV. = 0.289

APPROXIMATE RATIO OF PROCESS PLANS MODIFIED FOR CYLINDRICAL PARTS TO TOTAL NUMBER OF PROCESS PLANS OF ALL TYPES PREPARED ANNUALLY FOR CYLINDRICAL PARTS

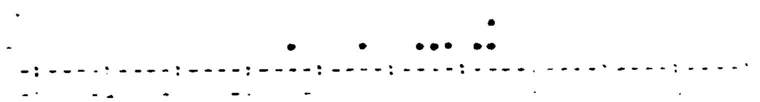
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	0.222
STD. DEV.	=	0.243
MIN. OBS.	=	0.024
MAX. OBS.	=	0.571



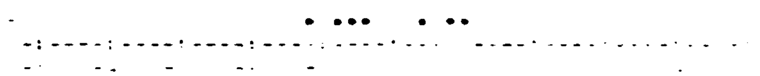
OTHER AEROSPACE

NO. OBS.	=	8
MEAN	=	0.507
STD. DEV.	=	0.230
MIN. OBS.	=	0.058
MAX. OBS.	=	0.714



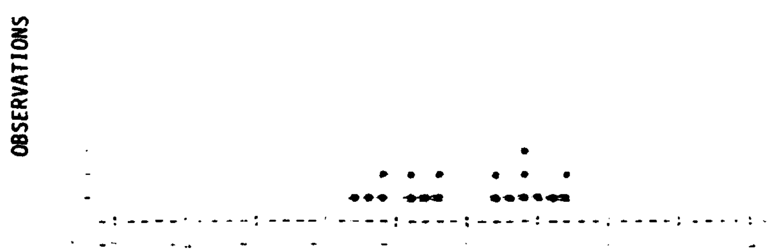
OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	0.362
STD. DEV.	=	0.195
MIN. OBS.	=	0.130
MAX. OBS.	=	0.625



ALL RESPONSES

NO. OBS.	=	19
MIN. OBS.	=	0.024
MAX. OBS.	=	0.714



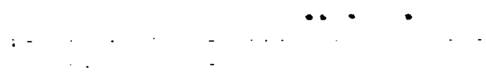
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 0.394 STD. DEV. = 0.236

APPROXIMATE RATIO OF PROCESS PLANS FOR NEW NON-CYLINDRICAL PARTS TO TOTAL NUMBER OF PROCESS PLANS OF ALL TYPES PREPARED ANNUALLY FOR NON-CYLINDRICAL PARTS

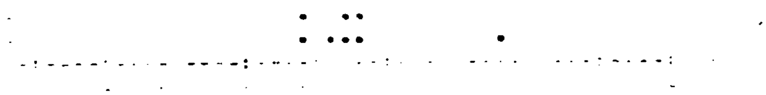
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 0.285
STD. DEV. = 0.145
MIN. OBS. = 0.154
MAX. OBS. = 0.488



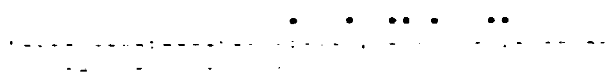
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 0.230
STD. DEV. = 0.228
MIN. OBS. = 0.055
MAX. OBS. = 0.768



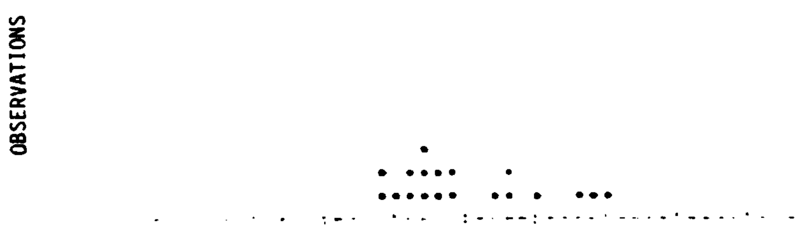
OTHER INDUSTRY

NO. OBS. = 7
MEAN = 0.513
STD. DEV. = 0.264
MIN. OBS. = 0.100
MAX. OBS. = 0.870



ALL RESPONSES

NO. OBS. = 19
MIN. OBS. = 0.055
MAX. OBS. = 0.870



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 0.346 STD. DEV. = 0.254

APPROXIMATE RATIO OF PROCESS PLANS FOR NEW CYLINDRICAL PARTS TO TOTAL NUMBER OF PROCESS PLANS OF ALL TYPES PREPARED ANNUALLY FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 0.331
STD. DEV. = 0.105
MIN. OBS. = 0.270
MAX. OBS. = 0.488

OTHER AEROSPACE

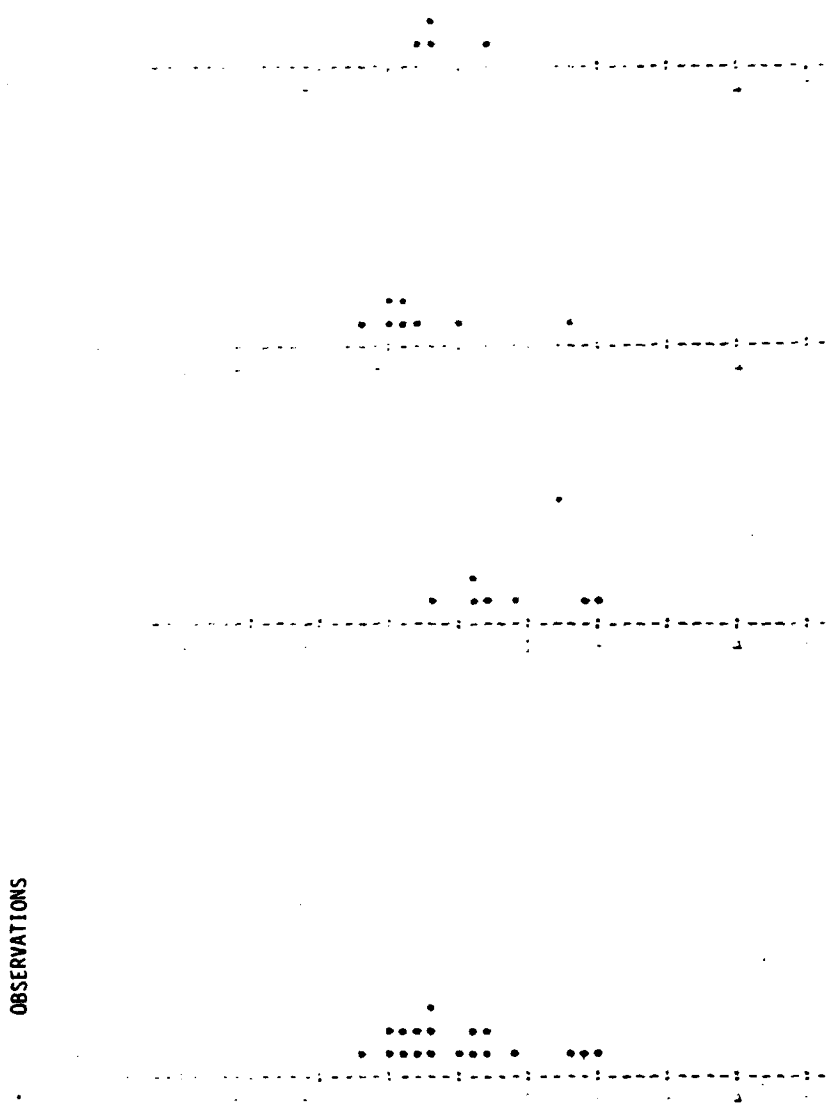
NO. OBS. = 8
MEAN = 0.276
STD. DEV. = 0.220
MIN. OBS. = 0.055
MAX. OBS. = 0.768

OTHER INDUSTRY

NO. OBS. = 7
MEAN = 0.564
STD. DEV. = 0.203
MIN. OBS. = 0.313
MAX. OBS. = 0.870

ALL RESPONSES

NO. OBS. = 19
MIN. OBS. = 0.055
MAX. OBS. = 0.870



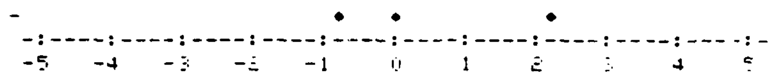
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 0.394 STD. DEV. = 0.230

APPROXIMATE PERCENTAGE OF PROCESS PLANNING COSTS ATTRIBUTABLE TO PREPARING STUDY PLANS FOR NON-CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 20.4%
STD. DEV. = 24.9%
MIN. OBS. = 13%
MAX. OBS. = 48.1%

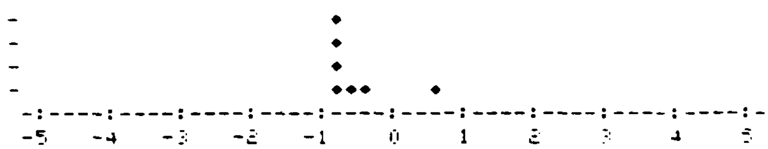


OTHER AEROSPACE

NO. OBS. = 5
MEAN = 19.1%
STD. DEV. = 18.4%
MIN. OBS. = 0.1%
MAX. OBS. = 48.4%

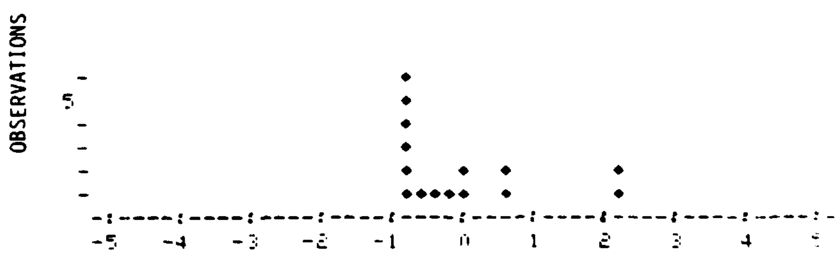
OTHER INDUSTRY

NO. OBS. = 7
MEAN = 4.8%
STD. DEV. = 8.7%
MIN. OBS. = 0%
MAX. OBS. = 23.9%



ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = 0%
MAX. OBS. = 48.4%

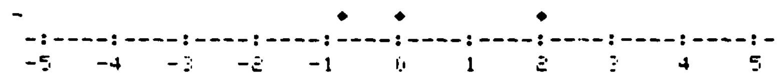


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 12.7% STD. DEV. = 16.6%

APPROXIMATE PERCENTAGE OF PROCESS PLANNING COSTS ATTRIBUTABLE TO PREPARING STUDY PLANS FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 19%
STD. DEV. = 22.6%
MIN. OBS. = 13%
MAX. OBS. = 44%

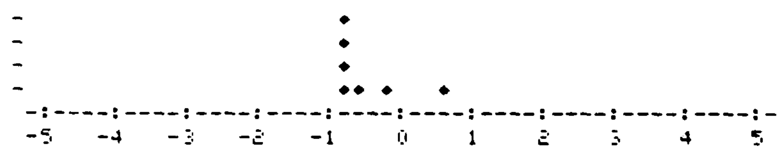


OTHER AEROSPACE

NO. OBS. = 5
MEAN = 20.4%
STD. DEV. = 14.5%
MIN. OBS. = 0.8%
MAX. OBS. = 37.7%

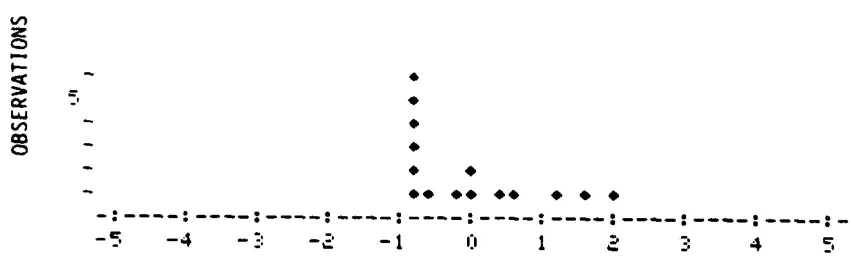
OTHER INDUSTRY

NO. OBS. = 7
MEAN = 5.1%
STD. DEV. = 8%
MIN. OBS. = 0%
MAX. OBS. = 30%



ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = 0%
MAX. OBS. = 30%

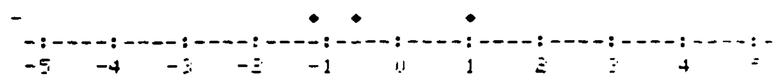


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 13% STD. DEV. = 14.8%

APPROXIMATE PERCENTAGE OF PROCESS PLANNING COSTS ATTRIBUTABLE TO MODIFYING EXISTING PLANS FOR NON-CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 25.5%
STD. DEV. = 30.9%
MIN. OBS. = 0.6%
MAX. OBS. = 60.0%

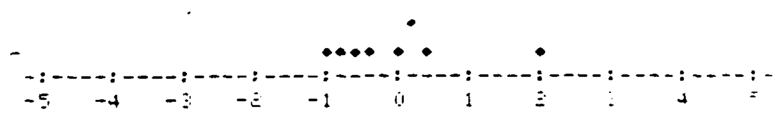


OTHER AEROSPACE

NO. OBS. = 5
MEAN = 42.4%
STD. DEV. = 28.2%
MIN. OBS. = 14.3%
MAX. OBS. = 80.3%

OTHER INDUSTRY

NO. OBS. = 7
MEAN = 32.8%
STD. DEV. = 27.5%
MIN. OBS. = 5.7%
MAX. OBS. = 88.2%



ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = 0.6%
MAX. OBS. = 88.2%

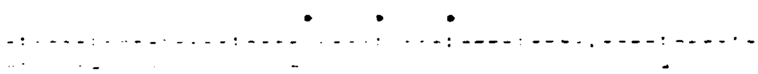
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 34.5% STD. DEV. = 27.0%

APPROXIMATE RATIO OF NEW PLUS MODIFIED PLANS PREPARED ANNUALLY FOR NON-CYLINDRICAL PARTS TO NUMBER OF NON-CYLINDRICAL PARTS PRODUCED ANNUALLY (BY PART NUMBER, NOT TOTAL VOLUME)

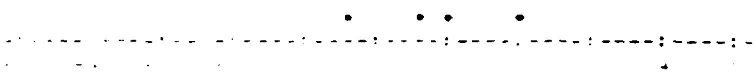
MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	0.654
STD. DEV.	=	0.532
MIN. OBS.	=	0.140
MAX. OBS.	=	1.203



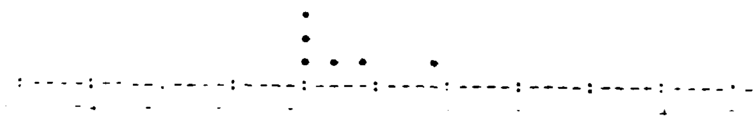
OTHER AEROSPACE

NO. OBS.	=	4
MEAN	=	1.061
STD. DEV.	=	0.543
MIN. OBS.	=	0.386
MAX. OBS.	=	1.705



OTHER INDUSTRY

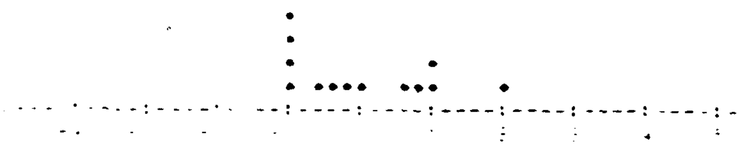
NO. OBS.	=	6
MEAN	=	0.359
STD. DEV.	=	0.365
MIN. OBS.	=	0.073
MAX. OBS.	=	1.014



OBSERVATIONS

ALL RESPONSES

NO. OBS.	=	13
MIN. OBS.	=	0.073
MAX. OBS.	=	1.705



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 0.643 STD. DEV. = 0.527

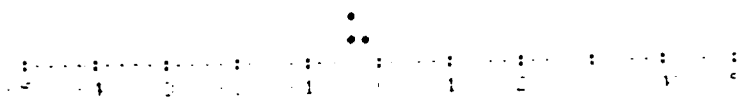
APPROXIMATE ANNUAL DOLLAR VALUE OF MATERIAL COSTS FOR CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = $ 0.6 MIL.
STD. DEV. = $ 0.8 MIL.
MIN. OBS. = $ 0.05 MIL.
MAX. OBS. = $ 1.7 MIL.

OTHER AEROSPACE

NO. OBS. = 3
MEAN = $ 1.5 MIL.
STD. DEV. = $ 1.1 MIL.
MIN. OBS. = $ 0.4 MIL.
MAX. OBS. = $ 2.5 MIL.

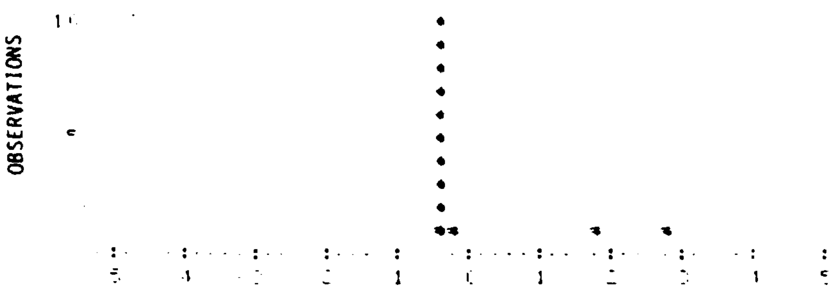


OTHER INDUSTRY

NO. OBS. = 6
MEAN = $14.9 MIL.
STD. DEV. = $23.3 MIL.
MIN. OBS. = $ 0.05 MIL.
MAX. OBS. = $52.7 MIL.

ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = $ 0.05 MIL.
MAX. OBS. = $52.7 MIL.



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $ 7.4 MIL. STD. DEV. = $16.7 MIL.

APPROXIMATE ANNUAL DOLLAR VALUE OF MATERIAL COSTS FOR NON-CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

MISSILE PRIMES & SUBS

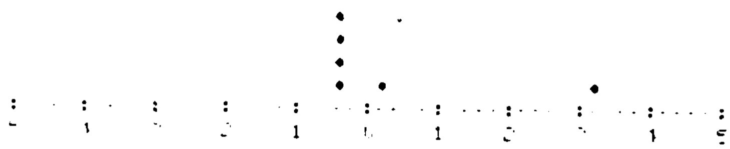
NO. OBS. = 4
MEAN = $ 0.6 MIL.
STD. DEV. = $ 0.5 MIL.
MIN. OBS. = $ 0.04 MIL.
MAX. OBS. = $ 1.2 MIL.

OTHER AEROSPACE

NO. OBS. = 3
MEAN = $ 2.9 MIL.
STD. DEV. = $ 3.1 MIL.
MIN. OBS. = $ 0.5 MIL.
MAX. OBS. = $ 6.4 MIL.

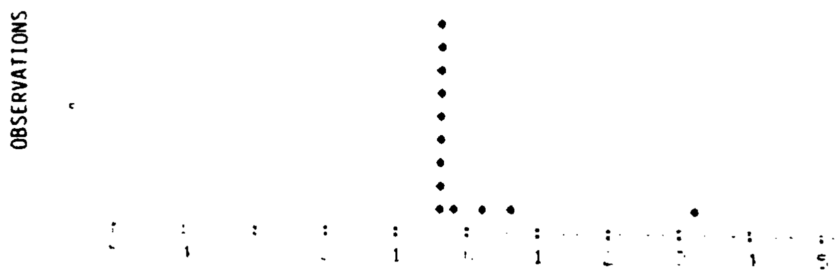
OTHER INDUSTRY

NO. OBS. = 6
MEAN = $ 4.7 MIL.
STD. DEV. = $ 8.8 MIL.
MIN. OBS. = $ 0.2 MIL.
MAX. OBS. = $22.5 MIL.



ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = $ 0.04 MIL.
MAX. OBS. = $22.5 M.

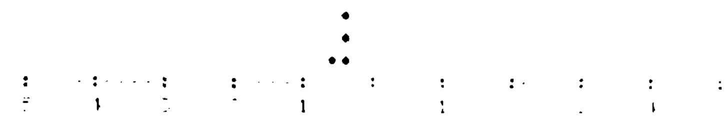


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $ 3.0 MIL. STD. DEV. = $ 6.1 MIL.

APPROXIMATE ANNUAL DOLLAR VALUE OF DIRECT LABOR COSTS FOR CYLINDRICAL MACHINED PARTS MANUFACTURED IN-HOUSE

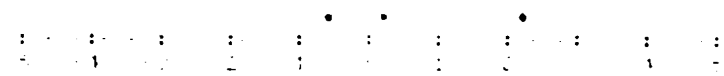
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = $ 1.2 MIL.
STD. DEV. = $ 0.7 MIL.
MIN. OBS. = $ 0.2 MIL.
MAX. OBS. = $ 1.9 MIL.



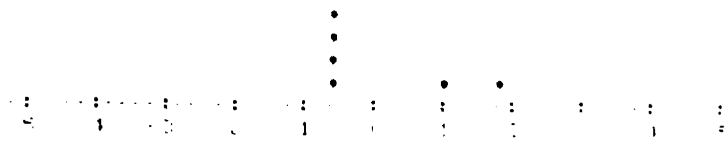
OTHER AEROSPACE

NO. OBS. = 3
MEAN = $ 7.1 MIL.
STD. DEV. = $ 8.0 MIL.
MIN. OBS. = $ 0.4 MIL.
MAX. OBS. = $16.0 MIL.



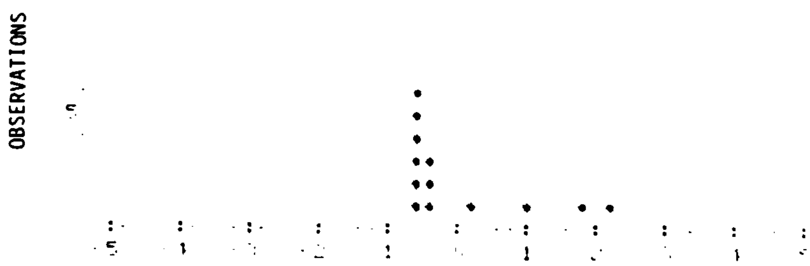
OTHER INDUSTRY

NO. OBS. = 6
MEAN = $ 4.0 MIL.
STD. DEV. = $ 6.0 MIL.
MIN. OBS. = $ 0.03 MIL.
MAX. OBS. = $14.0 MIL.



ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = $ 0.03 MIL
MAX. OBS. = $16.0 MIL.

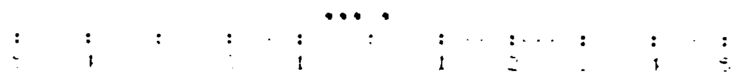


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $ 3.8 MIL. STD. DEV. = $5.6 MIL.

APPROXIMATE ANNUAL DOLLAR VALUE OF DIRECT LABOR COSTS FOR NON-CYLINDRICAL MACHINED PARTS MANUFACTURED IN-HOUSE

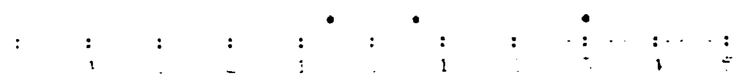
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	$ 2.0 MIL.
STD. DEV.	=	$ 1.7 MIL.
MIN. OBS.	=	$ 0.2 MIL.
MAX. OBS.	=	$ 4.2 MIL.



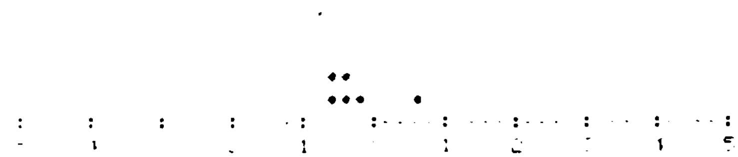
OTHER AEROSPACE

NO. OBS.	=	3
MEAN	=	$ 8.3 MIL.
STD. DEV.	=	$ 9.0 MIL.
MIN. OBS.	=	$ 0.4 MIL.
MAX. OBS.	=	$18.0 MIL.



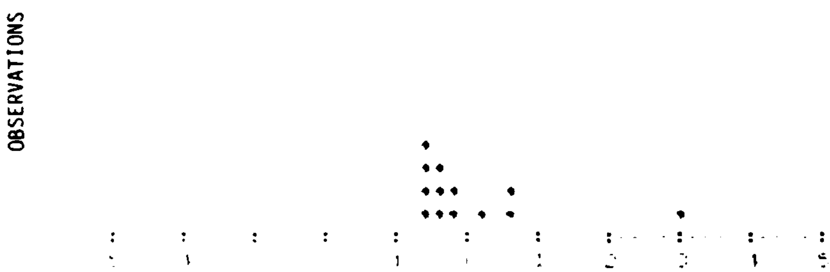
OTHER INDUSTRY

NO. OBS.	=	6
MEAN	=	$ 1.7 MIL.
STD. DEV.	=	$ 2.2 MIL.
MIN. OBS.	=	$ 0.03 MIL.
MAX. OBS.	=	$ 6.0 MIL.



ALL RESPONSES

NO. OBS.	=	13
MIN. OBS.	=	$0.03 MIL.
MAX. OBS.	=	$18.0 MIL.



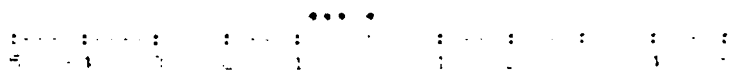
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $ 3.3 MIL.   STD. DEV. = $ 4.9 MIL.

APPROXIMATE ANNUAL DOLLAR VALUE OF TOOLING COSTS FOR CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = $ 0.7 MIL.
STD. DEV. = $ 0.9 MIL.
MIN. OBS. = $ 0.02 MIL.
MAX. OBS. = $ 1.9 MIL.

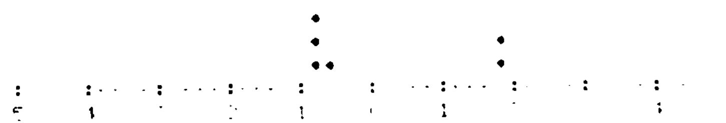


OTHER AEROSPACE

NO. OBS. = 3
MEAN = $ 2.3 MIL.
STD. DEV. = $ 2.2 MIL.
MIN. OBS. = $ 0.008 MIL.
MAX. OBS. = $ 4.4 MIL.

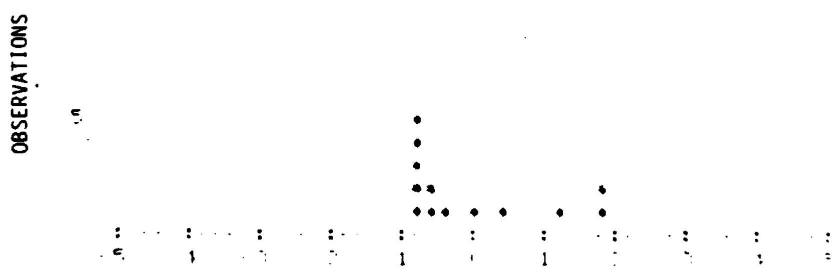
OTHER INDUSTRY

NO. OBS. = 6
MEAN = $ 2.0 MIL.
STD. DEV. = $ 3.0 MIL.
MIN. OBS. = $ 0.004 MIL.
MAX. OBS. = $ 6.0 MIL.



ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = $ 0.004 MIL.
MAX. OBS. = $ 6.0 MIL.

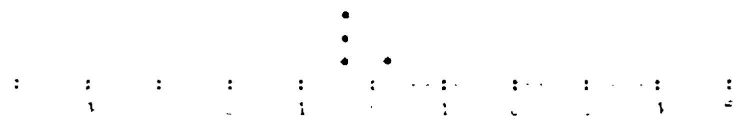


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $ 1.7 MIL. STD. DEV. = $ 2.3 MIL.

APPROXIMATE ANNUAL DOLLAR VALUE OF TOOLING COSTS FOR NON-CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = $ 0.8 MIL.
STD. DEV. = $ 1.2 MIL.
MIN. OBS. = $ 0.01 MIL.
MAX. OBS. = $ 2.5 MIL.

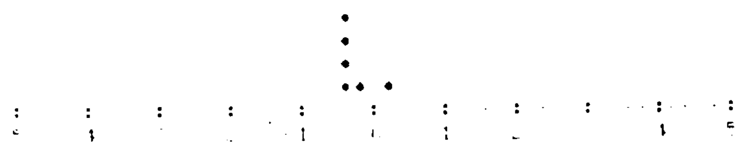


OTHER AEROSPACE

NO. OBS. = 3
MEAN = $ 5.7 MIL.
STD. DEV. = $ 9.0 MIL.
MIN. OBS. = $ 0.004 MIL.
MAX. OBS. = $ 16.1 MIL.

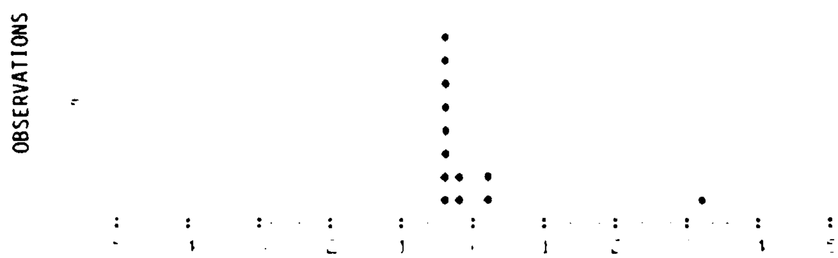
OTHER INDUSTRY

NO. OBS. = 6
MEAN = $ 0.6 MIL.
STD. DEV. = $ 0.9 MIL.
MIN. OBS. = $0.004 MIL.
MAX. OBS. = $ 2.5 MIL.



ALL RESPONSES

NO. OBS. = 6
MIN. OBS. = $ 0.004 MIL.
MAX. OBS. = $ 16.1 MIL.



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $ 1.9 MIL. STD. DEV. = $ 4.4 MIL.

APPROXIMATE ANNUAL DOLLAR VALUE OF SCRAP AND REWORK COSTS FOR CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

MISSILE PRIMES & SUBS

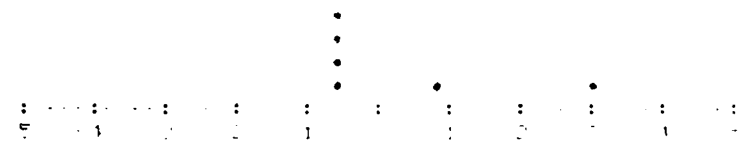
NO. OBS. = 4
MEAN = \$ 0.2 MIL.
STD. DEV. = \$ 0.2 MIL.
MIN. OBS. = \$ 0.05 MIL.
MAX. OBS. = \$ 0.5 MIL.

OTHER AEROSPACE

NO. OBS. = 3
MEAN = \$ 0.5 MIL.
STD. DEV. = \$ 0.5 MIL.
MIN. OBS. = \$ 0.02 MIL.
MAX. OBS. = \$ 0.9 MIL.

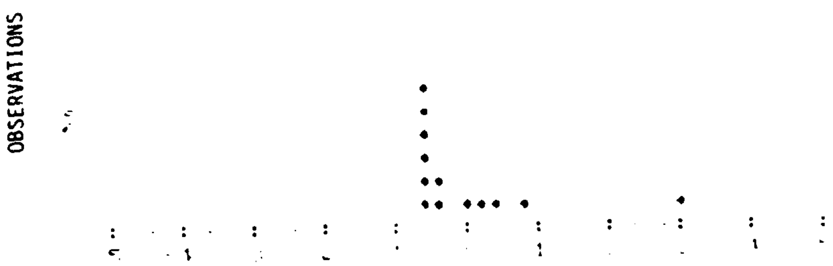
OTHER INDUSTRY

NO. OBS. = 6
MEAN = \$ 0.7 MIL.
STD. DEV. = \$ 1.2 MIL.
MIN. OBS. = \$ 0.004 MIL.
MAX. OBS. = \$ 3.0 MIL.



ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = \$ 0.004 MIL.
MAX. OBS. = \$ 3.0 MIL.



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = \$ 0.5 MIL. STD. DEV. = \$ 0.8 MIL.

APPROXIMATE ANNUAL DOLLAR VALUE OF SCRAP AND REWORK COSTS FOR NON-CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = $ 0.3 MIL.
STD. DEV. = $ 0.4 MIL.
MIN. OBS. = $ 0.04 MIL.
MAX. OBS. = $ 0.8 MIL.

OTHER AEROSPACE

NO. OBS. = 3
MEAN = $ 1.2 MIL.
STD. DEV. = $ 1.8 MIL.
MIN. OBS. = $ 0.09 MIL.
MAX. OBS. = $ 3.2 MIL.

OTHER INDUSTRY

NO. OBS. = 6
MEAN = $ 0.2 MIL.
STD. DEV. = $ 0.2 MIL.
MIN. OBS. = $0.004 MIL.
MAX. OBS. = $ 0.5 MIL.

ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = $ 0.004 MIL.
MAX. OBS. = $ 3.2 MIL.

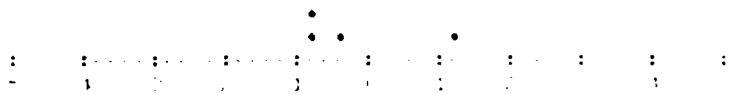
OBSERVATIONS

STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $ 0.5 MIL. STD. DEV. =$ 0.9 MIL.

APPROXIMATE ANNUAL DOLLAR VALUE OF PROCESS PLANNING COSTS FOR CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

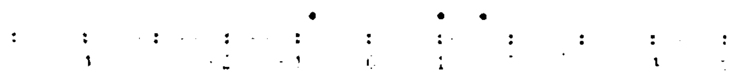
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = $ 0.9 MIL.
STD. DEV. = $ 1.3 MIL.
MIN. OBS. = $0.02 MIL.
MAX. OBS. = $ 2.8 MIL.



OTHER AEROSPACE

NO. OBS. = 3
MEAN = $ 2.0 MIL.
STD. DEV. = $ 1.8 MIL.
MIN. OBS. = $ 0.01 MIL.
MAX. OBS. = $ 3.5 MIL.

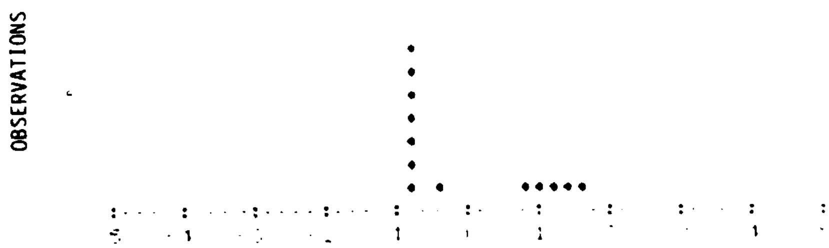


OTHER INDUSTRY

NO. OBS. = 6
MEAN = $ 0.9 MIL.
STD. DEV. = $ 1.4 MIL.
MIN. OBS. = $ 0.04 MIL.
MAX. OBS. = $ 3.0 MIL.

ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = $ 0.01 MIL.
MAX. OBS. = $ 3.5 MIL.

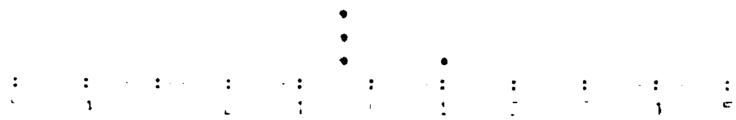


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $ 1.2 MIL.   STD. DEV. = $ 1.4 MIL.

APPROXIMATE ANNUAL DOLLAR VALUE OF PROCESS PLANNING COSTS FOR NON-CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = $ 1.4 MIL.
STD. DEV. = $ 2.5 MIL.
MIN. OBS. = $0.01 MIL.
MAX. OBS. = $ 5.1 MIL.

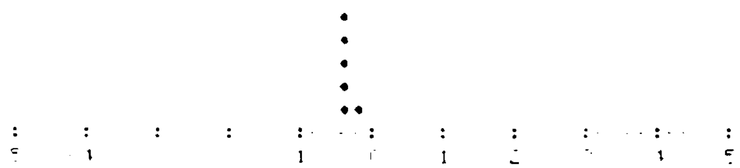


OTHER AEROSPACE

NO. OBS. = 3
MEAN = $ 4.6 MIL.
STD. DEV. = $ 7.2 MIL.
MIN. OBS. = $0.04 MIL.
MAX. OBS. = $12.9 MIL.

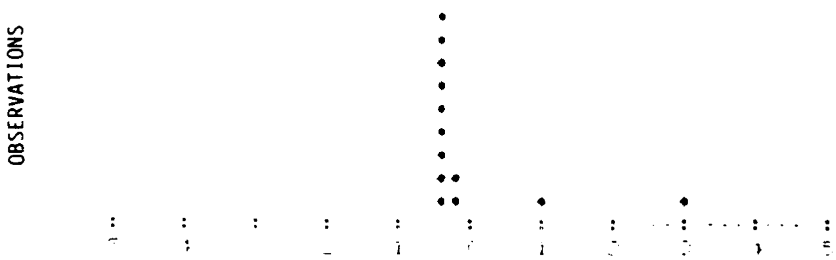
OTHER INDUSTRY

NO. OBS. = 6
MEAN = $ 0.3 MIL.
STD. DEV. = $ 0.4 MIL
MIN. OBS. = $ 0.04 MIL.
MAX. OBS. = $ 0.38 MIL.



ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = $ 0.01 MIL.
MAX. OBS. = $12.9 MIL.

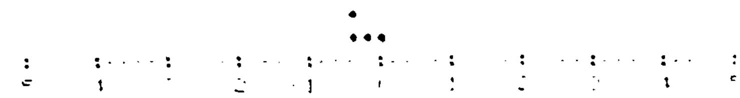


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $ 1.7 MIL   STD. DEV. = $ 3.6 MIL.

APPROXIMATE ANNUAL DOLLAR VALUE OF OVERHEAD, PROFIT, ETC., COSTS FOR CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

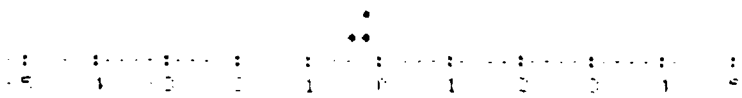
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = $ 1.8 MIL.
STD. DEV. = $ 2.1 MIL.
MIN. OBS. = $ 0
MAX. OBS. = $ 4.8 MIL.



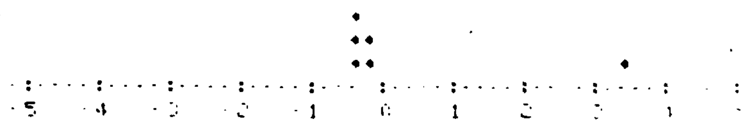
OTHER AEROSPACE

NO. OBS. = 3
MEAN = $ 1.5 MIL.
STD. DEV. = $ 0.5 MIL.
MIN. OBS. = $ 1.1 MIL.
MAX. OBS. = $ 2.1 MIL.



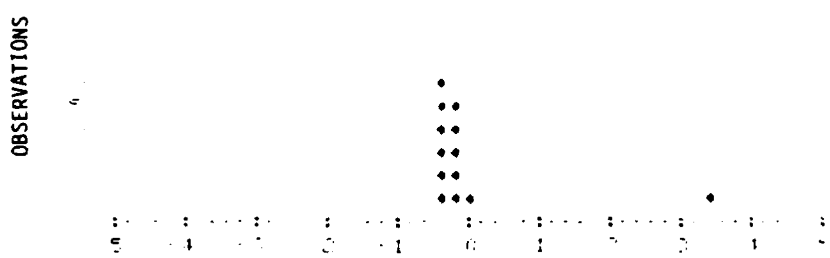
OTHER INDUSTRY

NO. OBS. = 6
MEAN = $ 7.7 MIL.
STD. DEV. = $16.3 MIL.
MIN. OBS. = $0.02 MIL.
MAX. OBS. = $ 41 MIL.



ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = $ 0
MAX. OBS. = $ 41 MIL.



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $ 4.4 MIL. STD. DEV. = $11.0 MIL.

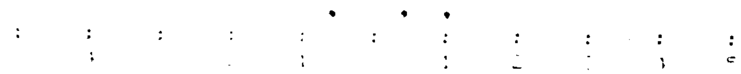
APPROXIMATE ANNUAL DOLLAR VALUE OF OVERHEAD, PROFIT, ETC., COSTS FOR NON-CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = $ 1.9 MIL.
STD. DEV. = $ 1.7 MIL.
MIN. OBS. = $ 0
MAX. OBS. = $ 3.4 MIL.

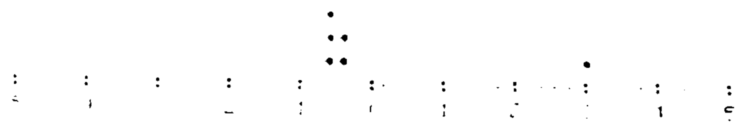
OTHER AEROSPACE

NO. OBS. = 3
MEAN = $ 4.6 MIL.
STD. DEV. = $ 3.7 MIL.
MIN. OBS. = $ 0.5 MIL.
MAX. OBS. = $ 7.7 MIL.



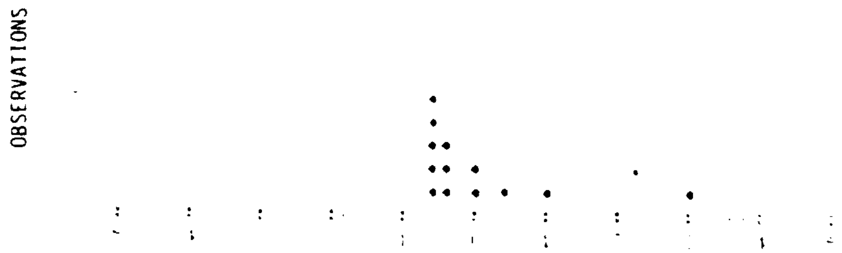
OTHER INDUSTRY

NO. OBS. = 6
MEAN = $ 3.6 MIL
STD. DEV. = $ 6.9 MIL.
MIN. OBS. = $ 0.1 MIL.
MAX. OBS. = $17.5 MIL.



ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = $ 0
MAX. OBS. = $ 17.5 MIL

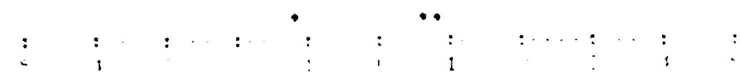


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $3.3 MIL. STD. DEV =$ 4.9 MIL.

APPROXIMATE DIFFERENCE BETWEEN PROCESS PLANNING COSTS DERIVED FROM Q13 AND Q18 AND PROCESS PLANNING COSTS DERIVED FROM Q19 (FOR CYLINDRICAL PARTS MANUFACTURED IN-HOUSE)

MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	$-1.1 mil.
STD. DEV.	=	$ 1.5 mil.
MIN. OBS.	=	$-2.8 mil.
MAX. OBS.	=	$-0.1 mil.

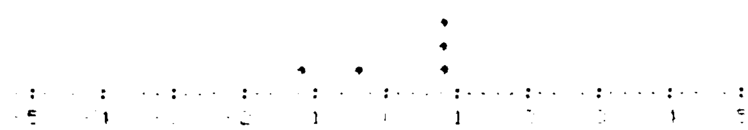


OTHER AEROSPACE

NO. OBS.	=	3
MEAN	=	$-1.6 mil.
STD. DEV.	=	$ 1.9 mil.
MIN. OBS.	=	$-3.5 mil.
MAX. OBS.	=	$ 0.3 mil.

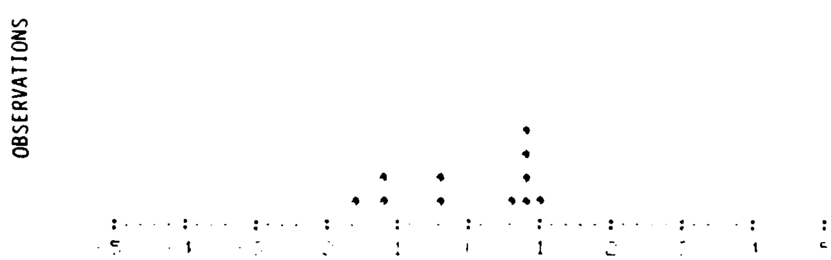
OTHER INDUSTRY

NO. OBS.	=	5
MEAN	=	$-0.9 mil.
STD. DEV.	=	$ 0.3 mil.
MIN. OBS.	=	$-2.9 mil.
MAX. OBS.	=	$0.03 mil.



ALL RESPONSES

NO. OBS.	=	11
MIN. OBS.	=	$-3.5 mil.
MAX. OBS.	=	$ 0.3 mil.



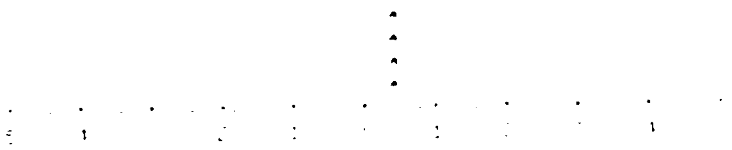
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $-1.3 mil. STD. DEV. = $1.4 mil.

APPROXIMATE CHANGE IN WORK IN PROCESS INVENTORY FOR CYLINDRICAL PARTS -- SYSTEM 1

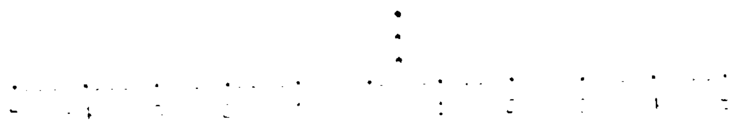
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	\$-4.9K
STD. DEV.	=	\$ 9.8K
MIN. OBS.	=	\$-19.5K
MAX. OBS.	=	\$ 0K



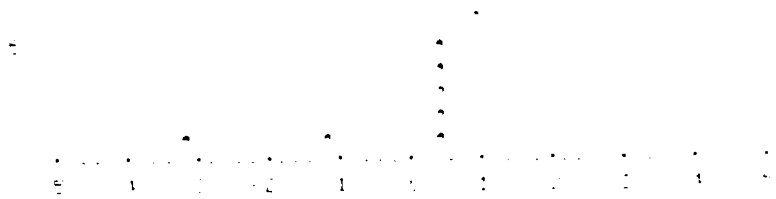
OTHER AEROSPACE

NO. OBS.	=	3
MEAN	=	\$-8.3K
STD. DEV.	=	\$14.4K
MIN. OBS.	=	\$-2.5K
MAX. OBS.	=	\$ 0K



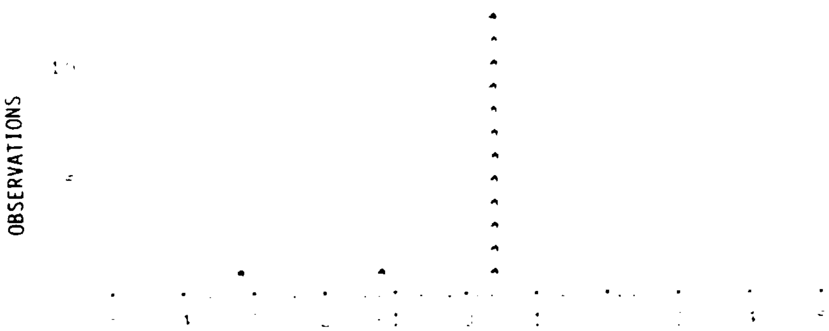
OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	\$-525.6K
STD. DEV.	=	\$965.6K
MIN. OBS.	=	\$-2500K
MAX. OBS.	=	\$ 0K



ALL RESPONSES

NO. OBS.	=	14
MIN. OBS.	=	\$-2500K
MAX. OBS.	=	\$ 0K



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$-266K STD. DEV. = \$709.2K

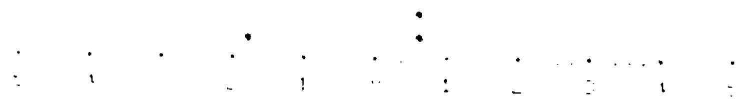
APPROXIMATE CHANGE IN ANNUAL SCRAP AND REWORK FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = $-25.4
STD. DEV. = $ 39.9K
MIN. OBS. = $-84.9K
MAX. OBS. = $ 0K

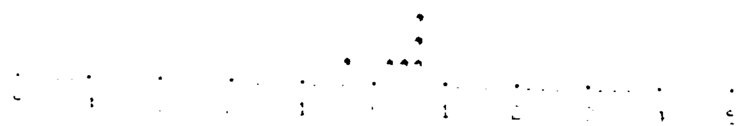
OTHER AEROSPACE

NO. OBS. = $ 3
MEAN = $ 21.8K
STD. DEV. = $ 36.9K
MIN. OBS. = $- 64.4K
MAX. OBS. = 0K



OTHER INDUSTRY

NO. OBS. = $ 6
MEAN = $-6.9K
STD. DEV. = $ 9.8K
MIN. OBS. = $- 25K
MAX. OBS. = $ 0K



ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = $-84.9K
MAX. OBS. = $ 0K

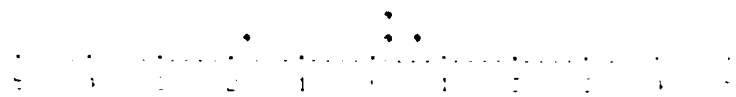
OBSERVATIONS

STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $ -16.0K STD. DEV. = $ 27 3K

APPROXIMATE CHANGE IN ANNUAL SCRAP AND REWORK FOR CYLINDRICAL PARTS -- SYSTEM 1

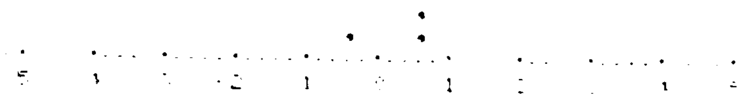
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = $-15.2K
STD. DEV. = $ 21.7K
MIN. OBS. = $-47.4K
MAX. OBS. = $ 0K



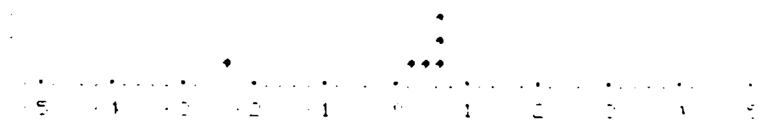
OTHER AEROSPACE

NO. OBS. = 3
MEAN = $- 5.9K
STD. DEV. = $ 10.0K
MIN. OBS. = $-17.5K
MAX. OBS. = $ 0K



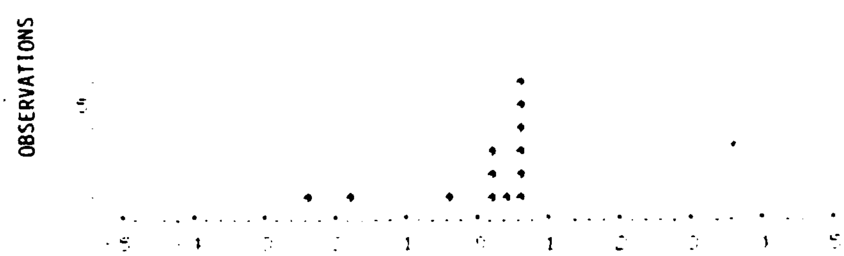
OTHER INDUSTRY

NO. OBS.. = 6
MEAN = $-11.5K
STD. DEV. = $ 23.2K
MIN. OBS. = $-58.5K
MAX. OBS. = $ 0K



ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = $-58.5K
MAX. OBS. = $ 0K

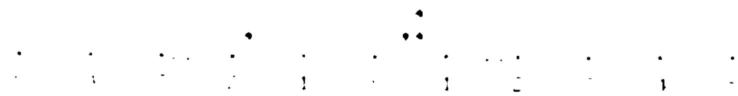


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $ - 11.3K STD. DEV. = $19.3K

APPROXIMATE CHANGE IN ANNUAL TOOLING COSTS FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

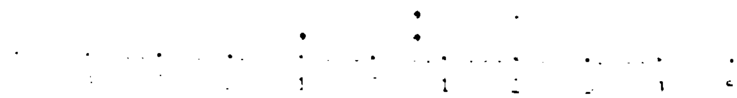
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	$ 13.0K
STD. DEV.	=	$ 252.5K
MIN. OBS.	=	$-508.8K
MAX. OBS.	=	



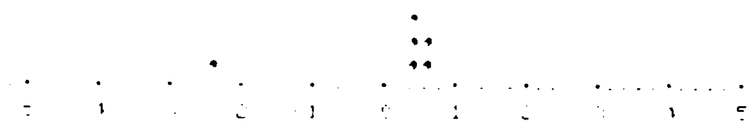
OTHER AEROSPACE

NO. OBS.	=	3
MEAN	=	$-107.5K
STD. DEV.	=	$ 185.8K
MIN. OBS.	=	$-322.0K
MAX. OBS.	=	$ 0K



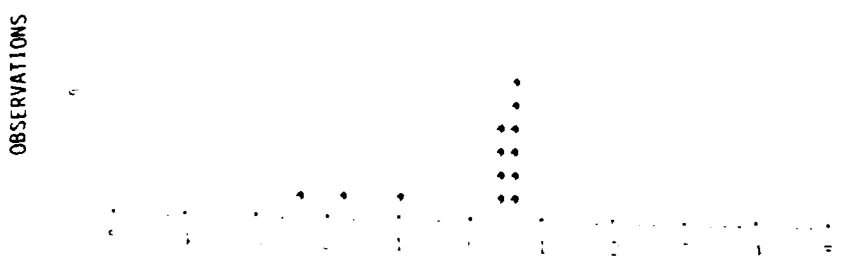
OTHER INDUSTRY

NO. OBS.	=	6
MEAN	=	$-110.6K
STD. DEV.	=	$ 252.1K
MIN. OBS.	=	$-625.0K
MAX. OBS.	=	$ 0K



ALL RESPONSES

NO. OBS.	=	13
MIN. OBS.	=	$-625.0K
MAX. OBS.	=	$ 0K



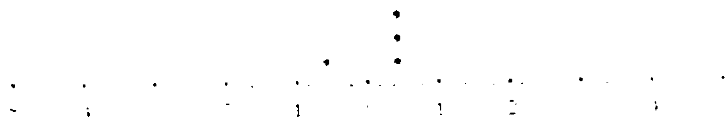
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $-115.8K STD. DEV. = $219.7K

APPROXIMATE CHANGE IN ANNUAL TOOLING COSTS FOR CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = $ -96.3K
STD. DEV. = $ 188.6K
MIN. OBS. = $-379.2K
MAX. OBS. = $

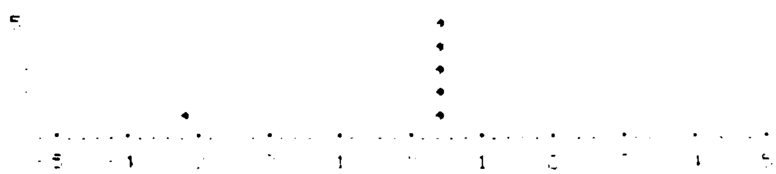


OTHER AEROSPACE

NO. OBS. = 3
MEAN = $- 29.2K
STD. DEV. = $ 50.4K
MIN. OBS. = $- 87.4K
MAX. OBS. = $

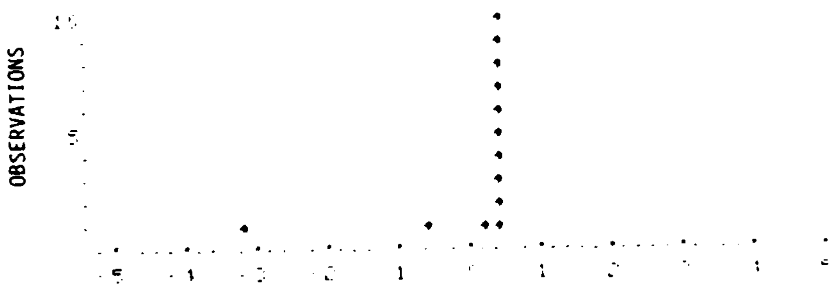
OTHER INDUSTRY

NO. OBS. = 6
MEAN = $-246.6K
STD. DEV. = $ 595.4K
MIN. OBS. = $
MAX. OBS. = $



ALL RESPONSES

NO. OBS. =
MIN. OBS. = $-1462K
MAX. OBS. = $



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $-150.2K STD. DEV. = $407.8K

APPROXIMATE CHANGE IN ANNUAL DIRECT LABOR COSTS FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

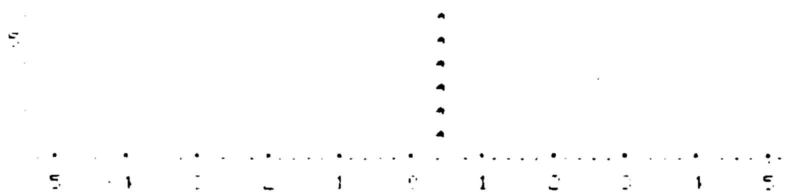
NO. OBS. = 4
MEAN = $-177.0K
STD. DEV. = $ 307.5K
MIN. OBS. = $-636.0K
MAX. OBS. = $ 0

OTHER AEROSPACE

NO. OBS. = 4
MEAN = $-780.3K
STD. DEV. = $1296.7K
MIN. OBS. = $-2704.5K
MAX. OBS. = $ 0

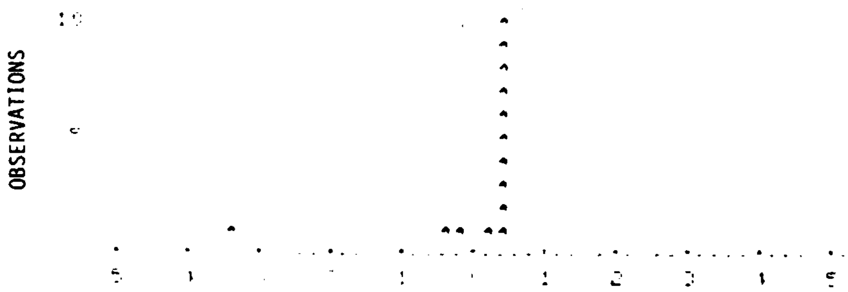
OTHER INDUSTRY

NO. OBS. = 6
MEAN = $- 16.4K
STD. DEV. = $ 24.2K
MIN. OBS. = $ - 48.0K
MAX. OBS. = $ 0



ALL RESPONSES

NO. OBS. = 14
MIN. OBS = $-2704K
MAX. OBS. = $ 0

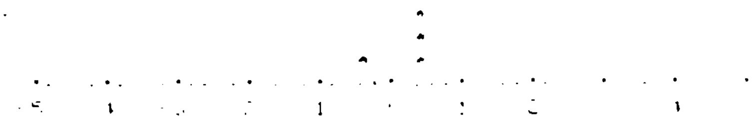


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $-280.5K STD. DEV. = $722.5K

APPROXIMATE CHANGE IN ANNUAL DIRECT LABOR COSTS FOR CYLINDRICAL PARTS -- SYSTEM 1

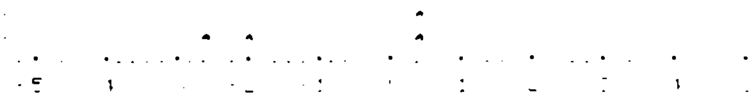
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = $ -81.2K
STD. DEV. = $ 136.0K
MIN. OBS. = $-284.0K
MAX. OBS. = $ 0



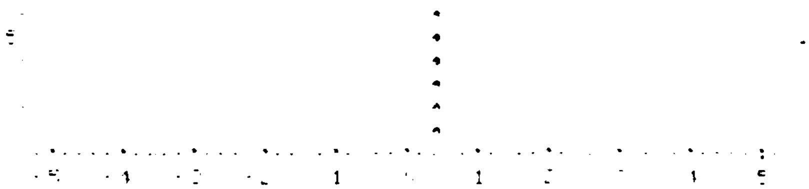
OTHER AEROSPACE

NO. OBS. = 4
MEAN = $-427.9K
STD. DEV. = $ 490.6K
MIN. OBS. = $-957K
MAX. OBS. = $ 0



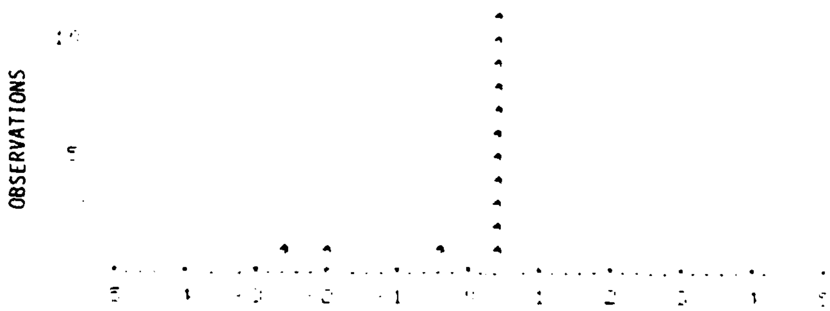
OTHER INDUSTRY

NO. OBS. = 6
MEAN = $ -11.5K
STD. DEV. = $ 19.2K
MIN. OBS. = $ -48.0K
MAX. OBS. = $ 0



ALL RESPONSES

NO. OBS. = 4
MIN. OBS. = $-975K
MAX. OBS. = $ 0



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $150.3K STD. DEV. = $306.6K

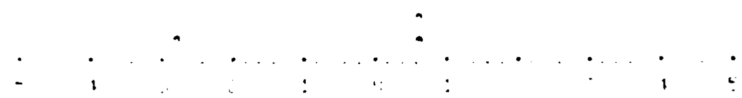
APPROXIMATE CHANGE IN ANNUAL MATERIAL FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = $ -14.3K
STD. DEV. = $ 19.7K
MIN. OBS. = $ -42.4K
MAX. OBS. = $ 0

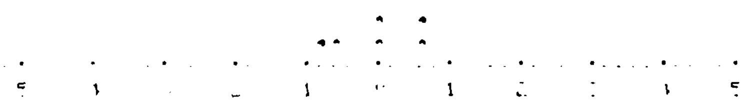
OTHER AEROSPACE

NO. OBS. = 3
MEAN = $ -42.9K
STD. DEV. = $ 74.4K
MIN. OBS. = $-128.8K
MAX. OBS. = $ 0



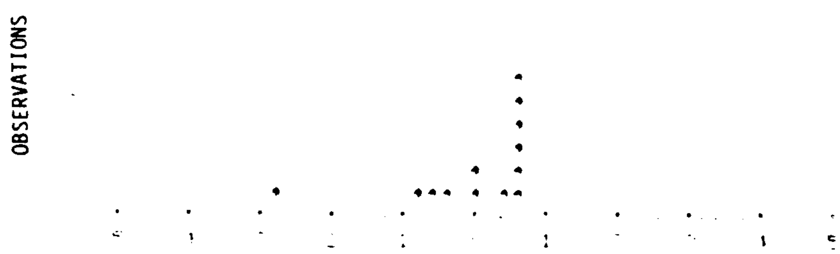
OTHER INDUSTRY

NO. OBS. = 6
MEAN = $ -24.4K
STD. DEV. = $ 22.7K
MIN. OBS. = $ -56.1K
MAX. OBS. = $ 0



ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = $-128.8K
MAX. OBS. = $ 0



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $-25.6K STD. DEV. = $36.8K

APPROXIMATE CHANGE IN ANNUAL MATERIAL FOR CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

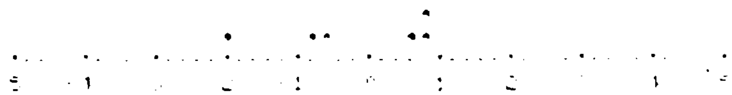
NO. OBS. = 4
MEAN = $ -7.9K
STD. DEV. = $ 11.0K
MIN. OBS. = $ -23.7K
MAX. OBS. = $ 0

OTHER AEROSPACE

NO. OBS. = 3
MEAN = $ -12.3K
STD. DEV. = $ 19.7K
MIN. OBS. = $ -35K
MAX. OBS. = $ 0

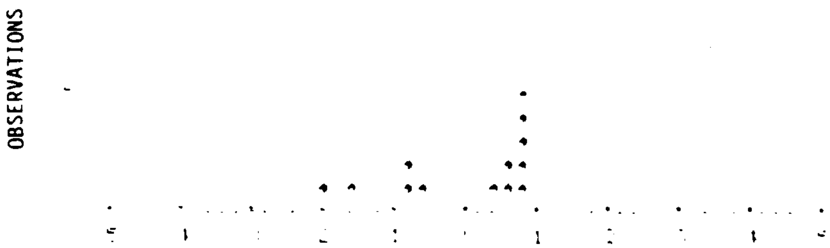
OTHER INDUSTRY

NO. OBS. = 6
MEAN = $ -15K
STD. DEV. = $ 17.1K
MIN. OBS. = $ -42K
MAX. OBS. = $ 0



ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = $-42K
MAX. OBS. = $ 0

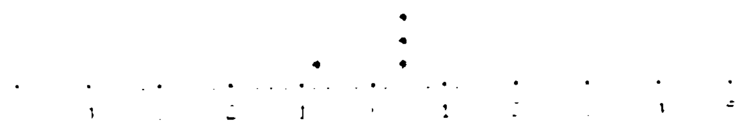


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $-12.2K STD. DEV. = $15.1K

APPROXIMATE CHANGE IN ANNUAL PROCESS PLANNING COSTS FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

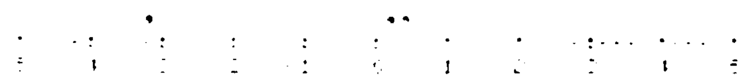
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = $-516.8K
STD. DEV. = $1019K
MIN. OBS. = $-2035K
MAX. OBS. = $ 32.5K



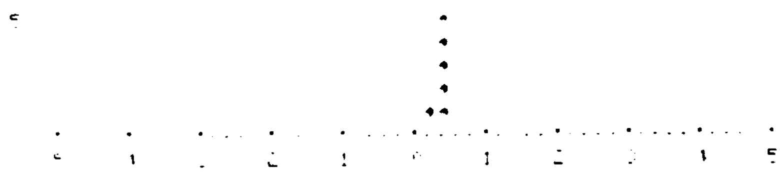
OTHER AEROSPACE

NO. OBS. = 3
MEAN = $ -2172K
STD. DEV. = $3586K
MIN. OBS. = $-6311K
MAX. OBS. = $ -5.7K



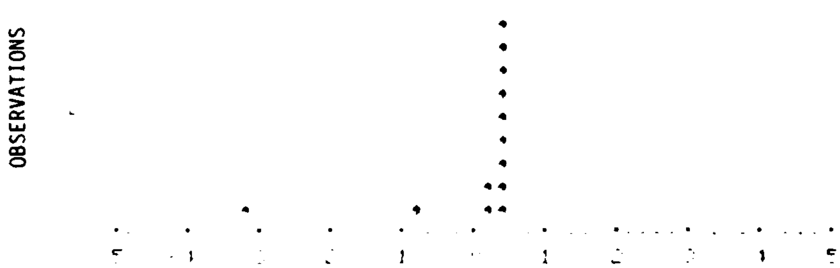
OTHER INDUSTRY

NO. OBS. = 6
MEAN = $-107.1K
STD. DEV. = $ 153.5K
MIN. OBS. = $-400K
MAX. OBS. = $ -1.3K



ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = $-6311K
MAX. OBS. = $ 32.5K



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $-706.5K STD. DEV. = $1773K

APPROXIMATE CHANGE IN ANNUAL PROCESS PLANNING COSTS FOR CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

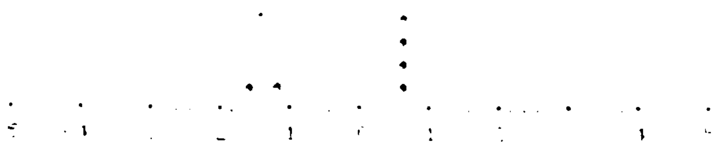
NO. OBS. = 4
MEAN = $-276.1K
STD. DEV. = $ 575.2K
MIN. OBS. = $-1138K
MAX. OBS. = $ 47.5K

OTHER AEROSPACE

NO. OBS. = 3
MEAN = $-738.4K
STD. DEV. = $ 881.3K
MIN. OBS. = $-1715K
MAX. OBS. = $ -2.3K

OTHER INDUSTRY

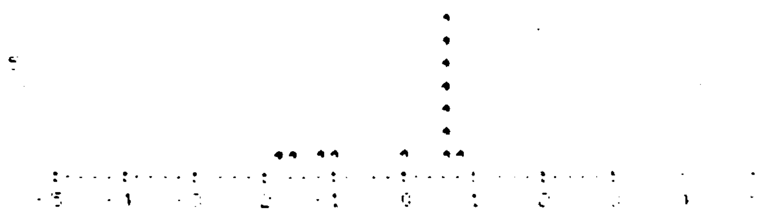
NO. OBS. = 6
MEAN = $-470.6K
STD. DEV. = $ 716.0K
MIN. OBS. = $-1495K
MAX. OBS. = $ -7.3K



ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = $-1715K
MAX. OBS. = $ 47.5K

OBSERVATIONS

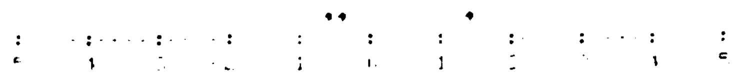


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $-472.6K STD. DEV. = $675.5K

APPROXIMATE RATIO OF PROCESS PLANNING COSTS DERIVED FROM Q19 TO PROCESS PLANNING COSTS DERIVED FROM Q13 AND Q18 (FOR NON-CYLINDRICAL PARTS MANUFACTURED IN-HOUSE)

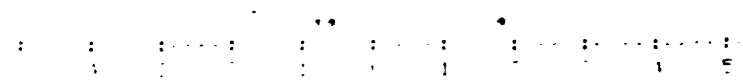
MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	11.5
STD. DEV.	=	14.9
MIN. OBS.	=	2.0
MAX. OBS.	=	28.7



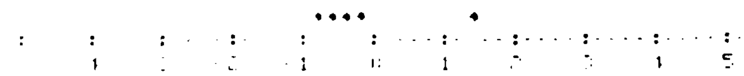
OTHER AEROSPACE

NO. OBS.	=	3
MEAN	=	11.8
STD. DEV.	=	17.7
MIN. OBS.	=	0.03
MAX. OBS.	=	32.2



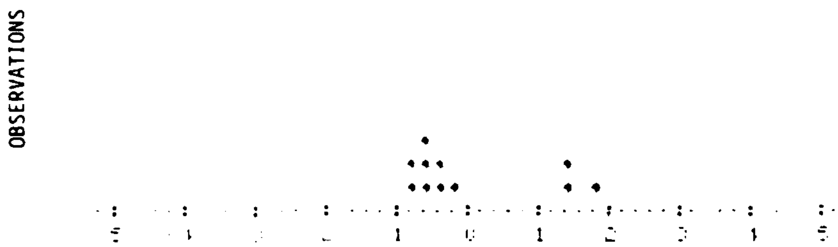
OTHER INDUSTRY

NO. OBS.	=	5
MEAN	=	8.6
STD. DEV.	=	11.8
MIN. OBS.	=	0.7
MAX. OBS.	=	29.3



ALL RESPONSES

NO. OBS.	=	11
MIN. OBS.	=	0.03
MAX. OBS.	=	32.2



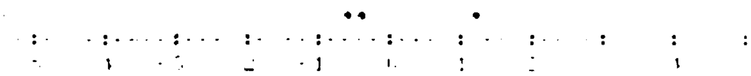
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 10.3 STD. DEV. = 12.8

APPROXIMATE RATIO OF PROCESS PLANNING COSTS DERIVED FROM Q19 TO PROCESS PLANNING COSTS DERIVED FROM Q13 AND Q18 (FOR CYLINDRICAL PARTS MANUFACTURED IN-HOUSE)

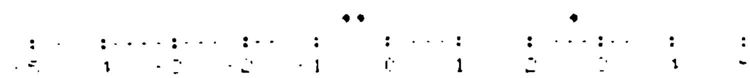
MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	25.4
STD. DEV.	=	35.2
MIN. OBS.	=	2.0
MAX. OBS.	=	65.8



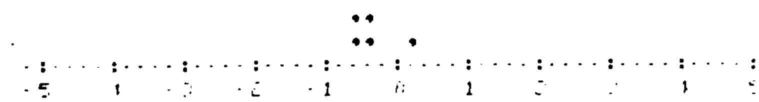
OTHER AEROSPACE

NO. OBS.	=	3
MEAN	=	42.7
STD. DEV.	=	71.4
MIN. OBS.	=	0.02
MAX. OBS.	=	125.0



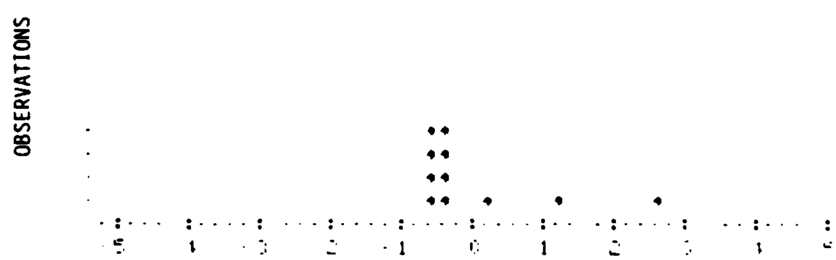
OTHER INDUSTRY

NO. OBS.	=	5
MEAN	=	8.2
STD. DEV.	=	13.0
MIN. OBS.	=	0.7
MAX. OBS.	=	31.3



ALL RESPONSES

NO. OBS.	=	11
MIN. OBS.	=	0.02
MAX. OBS.	=	125.0



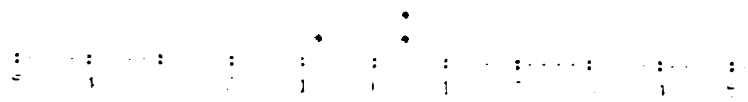
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 22.3 STD. DEV. = 39.5

APPROXIMATE DIFFERENCE BETWEEN PROCESS PLANNING COSTS DERIVED FROM Q13 AND Q18 AND PROCESS PLANNING COSTS DERIVED FROM Q19 (FOR NON-CYLINDRICAL PARTS MANUFACTURED IN-HOUSE)

MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	$-1.8 mil.
STD. DEV.	=	$ 2.7 mil.
MIN. OBS.	=	$-4.9 mil.
MAX. OBS.	=	$-0.1 mil.

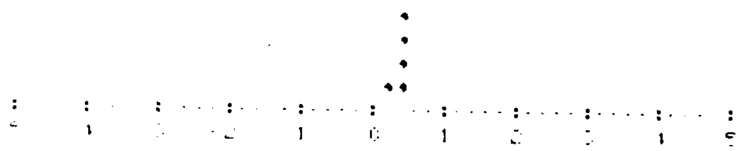


OTHER AEROSPACE

NO. OBS.	=	3
MEAN	=	$-4.0 mil.
STD. DEV.	=	$ 7.4 mil.
MIN. OBS.	=	$-12.5 mil.
MAX. OBS.	=	$ 1.1 mil.

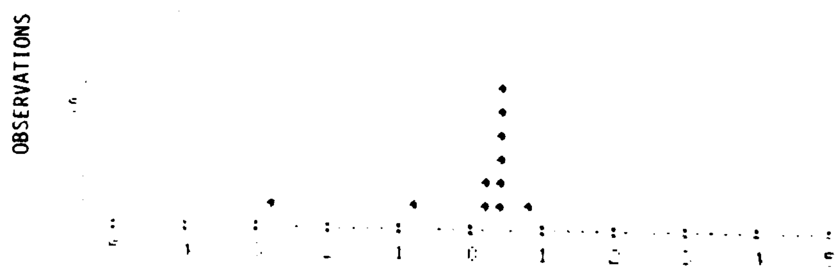
OTHER INDUSTRY

NO. OBS.	=	5
MEAN	=	$-0.2 mil.
STD. DEV.	=	$ 0.2 mil.
MIN. OBS.	=	$-0.6 mil.
MAX. OBS.	=	$0.02 mil.



ALL RESPONSES

NO. OBS.	=	11
MIN. OBS.	=	$-12.5 mil.
MAX. OBS.	=	$ 1.1 mil.



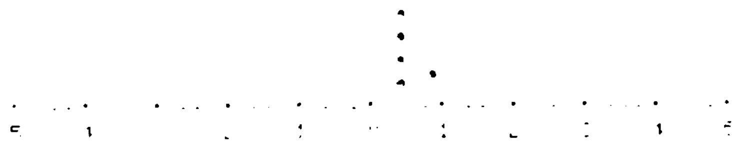
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $-1.7 mil. STD. DEV. = $3.8 mil.

APPROXIMATE CHANGE IN WORK IN PROCESS INVENTORY FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

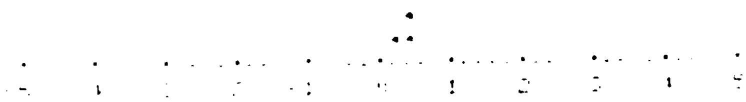
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	$-4.5K
STD. DEV.	=	$ 9K
MIN. OBS.	=	$ -18K
MAX. OBS.	=	$ 0K



OTHER AEROSPACE

NO. OBS.	=	3
MEAN	=	$ -20K
STD. DEV.	=	$34.6K
MIN. OBS.	=	$ -60K
MAX. OBS.	=	$ 0K



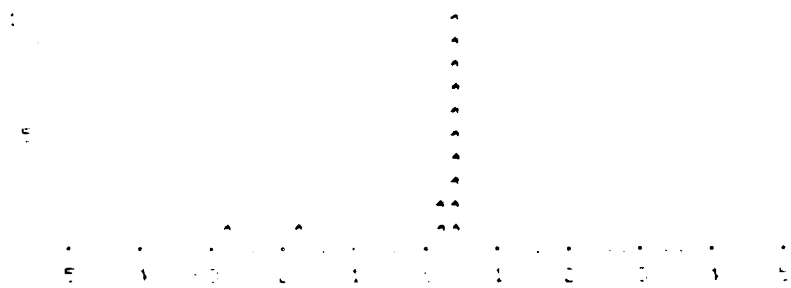
OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	$-251.6K
STD. DEV.	=	$ 409K
MIN. OBS.	=	$-1000K
MAX. OBS.	=	$ 0K

ALL RESPONSES

NO. OBS.	=	14
MIN. OBS.	=	$-1000K
MAX. OBS.	=	$ 0K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $-131.4K STD. DEV. = $305K

APPROXIMATE CHANGE IN PROCESS PLANNING COSTS FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

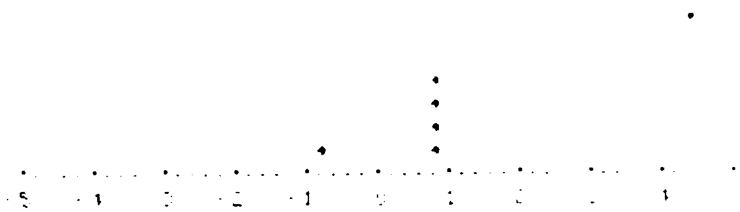
NO. OBS.	=	1
MEAN	=	$-2544K
STD. DEV.	=	$0
MIN. OBS.	=	$-2544K
MAX. OBS.	=	$-2544K

OTHER AEROSPACE

NO. OBS.	=	3
MEAN	=	$-908.4K
STD. DEV.	=	$1077.5K
MIN. OBS.	=	$ -2.7K
MAX. OBS.	=	$-2100.0K

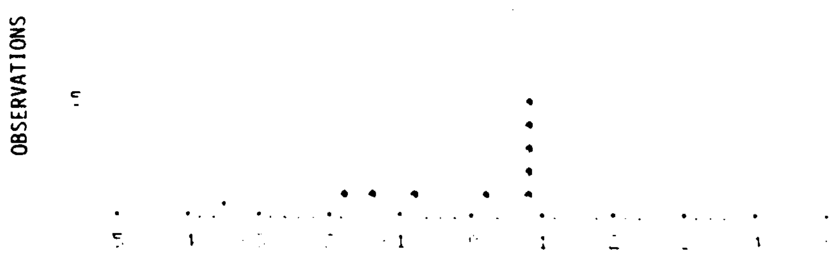
OTHER INDUSTRY

NO. OBS.	=	5
MEAN	=	$-319.1K
STD. DEV.	=	$657.5K
MIN. OBS.	=	$-6.0K
MAX. OBS.	=	$-1495.0K



ALL RESPONSES

NO. OBS.	=	9
MIN. OBS.	=	$-2544K
MAX. OBS.	=	$-2.7K



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $-762.8K STD. DEV. = $1016.9K

APPROXIMATE CHANGE IN PROCESS PLANNING COSTS FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

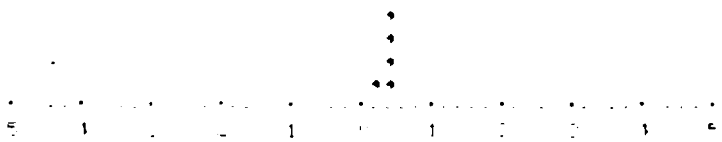
NO. OBS. = 1
MEAN = $-23.7K
STD. DEV. = $0
MIN. OBS. = $-23.7K
MAX. OBS. = $-23.7K

OTHER AEROSPACE

NO. OBS. = 3
MEAN = $-2661.0K
STD. DEV. = $4389.8K
MIN. OBS. = $-7728.0K
MAX. OBS. = $-1.6K

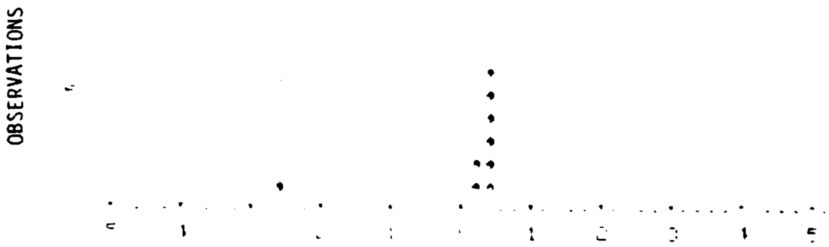
OTHER INDUSTRY

NO. OBS. = 5
MEAN = $-147.8K
STD. DEV. = $175.7K
MIN. OBS. = $-450.0K
MAX. OBS. = $-38.5K



ALL RESPONSES

NO. OBS. = 9
MIN. OBS. = $-7728K
MAX. OBS. = $-7.6K



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $-971.8K STD. DEV. = $2537.7K

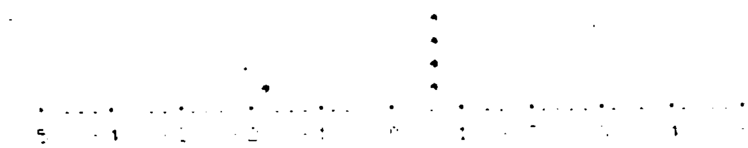
APPROXIMATE CHANGE IN MATERIAL COSTS FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 2
MEAN = $-24.5K
STD. DEV. = $32.4K
MIN. OBS. = $-47.4K
MAX. OBS. = $-1.53K

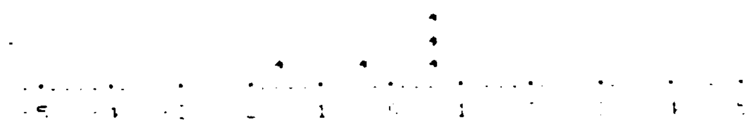
OTHER AEROSPACE

NO. OBS. = 5
MEAN = $-10.9K
STD. DEV. = $23.3K
MIN. OBS. = $-52.5K
MAX. OBS. = $0



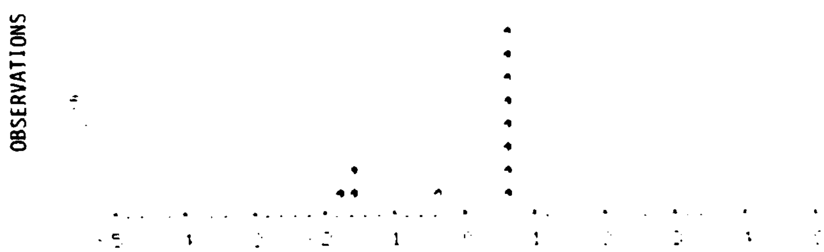
OTHER INDUSTRY

NO. OBS. = 5
MEAN = $-14.4K
STD. DEV. = $20.9K
MIN. OBS. = $-48.0K
MAX. OBS. = $0



ALL RESPONSES

NO. OBS. = 12
MIN. OBS. = $-52.5K
MAX. OBS. = $0



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $-14.6K STD. DEV. = $21.8K

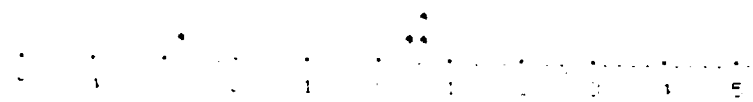
APPROXIMATE CHANGE IN MATERIAL COSTS FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS.	=	2
MEAN	=	$-0.6K
STD. DEV.	=	$ 0.8K
MIN. OBS.	=	$-1.1K
MAX. OBS.	=	$0

OTHER AEROSPACE

NO. OBS.	=	4
MEAN	=	$-50.6K
STD. DEV.	=	$95.2K
MIN. OBS.	=	$-193.2K
MAX. OBS.	=	$0

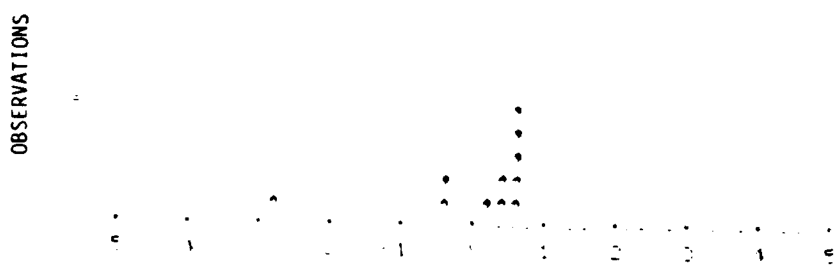


OTHER INDUSTRY

NO. OBS.	=	5
MEAN	=	$-25.3K
STD. DEV.	=	$26.2K
MIN. OBS.	=	$-56.1K
MAX. OBS.	=	$0

ALL RESPONSES

NO. OBS.	=	11
MIN. OBS.	=	$-193.2K
MAX. OBS.	=	$0



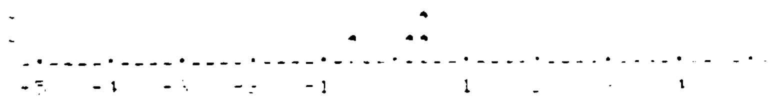
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $-30.0K   STD. DEV. = $57.9K

APPROXIMATE CHANGE IN DIRECT LABOR COSTS FOR CYLINDRICAL PARTS -- SYSTEM 2

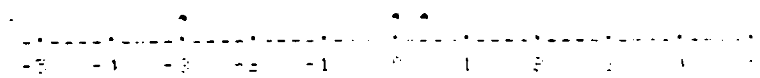
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = $-96K
STD. DEV. = $127K
MIN. OBS. = $-284K
MAX. OBS. = $-13.4K



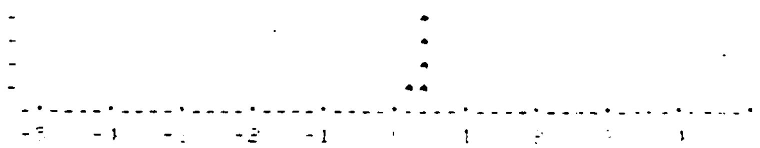
OTHER AEROSPACE

NO. OBS. = 3
MEAN = $-316K
STD. DEV. = $448K
MIN. OBS. = $-831K
MAX. OBS. = $-21.5K



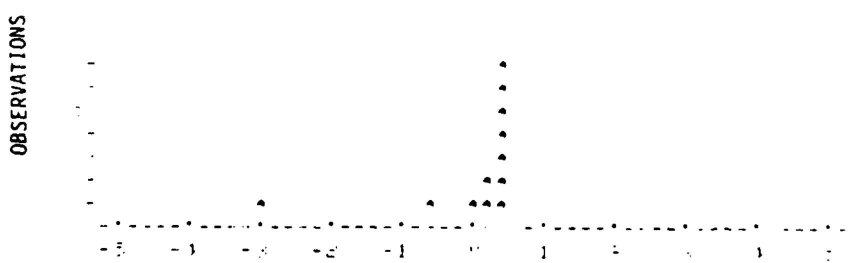
OTHER INDUSTRY

NO. OBS. = 5
MEAN = $-17K
STD. DEV. = $25K
MIN. OBS. = $-60K
MAX. OBS. = $0



ALL RESPONSES

NO. OBS. = 12
MIN. OBS. = $-831K
MAX. OBS. = $0



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $-118K STD. DEV. = $238K

APPROXIMATE CHANGE IN DIRECT LABOR COSTS FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

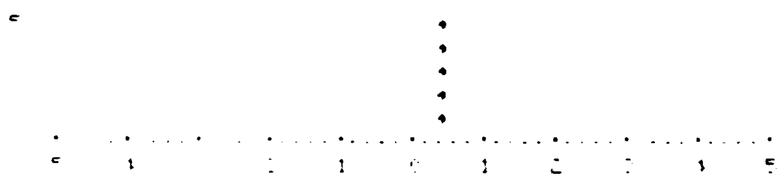
NO. OBS. = 4
MEAN = $-195.3K
STD. DEV. = $297.3K
MIN. OBS. = $-636.0K
MAX OBS. = $-9.5K

OTHER AEROSPACE

NO. OBS. = 3
MEAN = $-1079K
STD. DEV. = $ 1720K
MIN. OBS. =
MAX. OBS. = $-66.5K

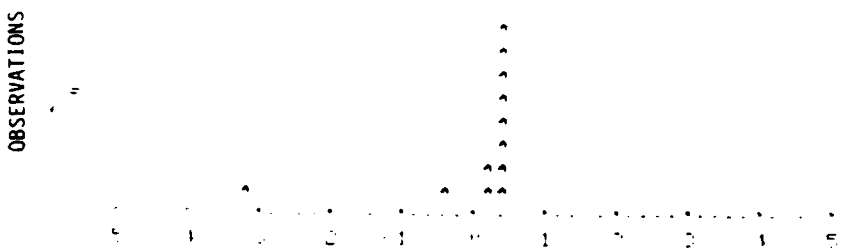
OTHER INDUSTRY

NO. OBS. = 5
MEAN = $-28.3K
STD. DEV. = $25.9K
MIN. OBS. = $ -48K
MAX. OBS. = $0



ALL RESPONSES

NO. OBS. = 12
MIN. OBS. = $-3065K
MAX. OBS. = $0

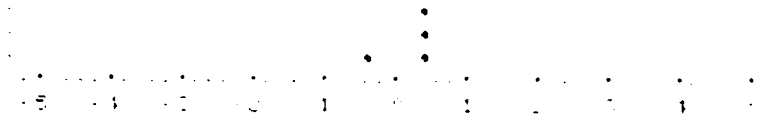


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $-346.7K STD. DEV. = $873.5K

APPROXIMATE CHANGE IN TOOLING COSTS FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = $-103.8K
STD. DEV. = $183.8K
MIN. OBS. = $-379.2K
MAX. OBS. = $-0.6K

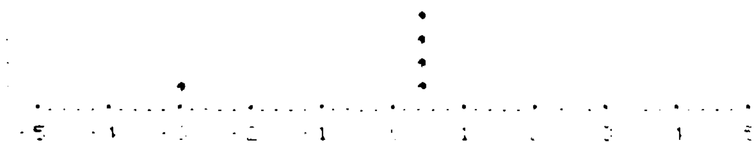


OTHER AEROSPACE

NO. OBS. = 3
MEAN = $-96.5K
STD. DEV. = $119.1K
MIN. OBS. = $-230.0K
MAX. OBS. = $-0.8K

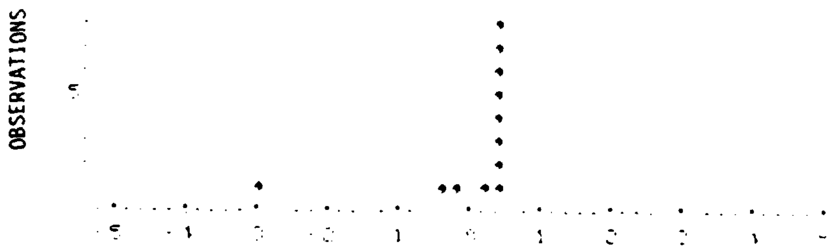
OTHER INDUSTRY

NO. OBS. = 5
MEAN = $-296.0K
STD. DEV. = $652.1K
MIN. OBS. =$-1462.5K
MAX. OBS. = $0



ALL RESPONSES

NO. OBS. = 12
MIN. OBS. =$-1462.5K
MAX. OBS. = $0

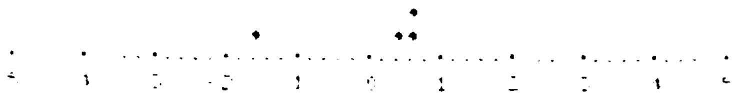


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $-187.4K STD. DEV. = $418.9K

APPROXIMATE CHANGE IN TOOLING COSTS FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

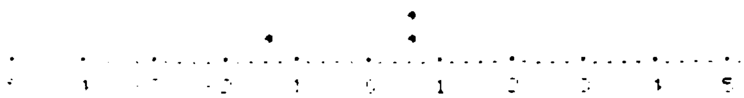
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = $-137.9K
STD. DEV. = $247.7K
MIN. OBS. = $-508.8K
MAX. OBS. = $ 0.4K



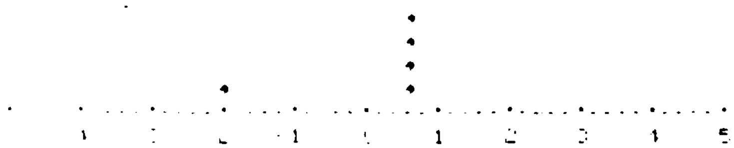
OTHER AEROSPACE

NO. OBS. = 3
MEAN = -$167.8K
STD. DEV. = $273.4K
MIN. OBS. = $-483.3K
MAX. OBS. = $ 0.4K



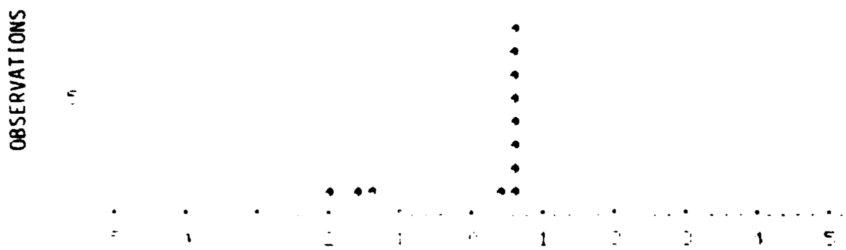
OTHER INDUSTRY

NO. OBS. = 5
MEAN = $-132.7K
STD. DEV. = $275.3K
MIN. OBS. = $-625.0K
MAX. OBS. = $0



ALL RESPONSES

NO. OBS. = 12
MIN. OBS. = $-625.0K
MAX. OBS. = $0



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $-143.2K STD. DEV. = $241.0K

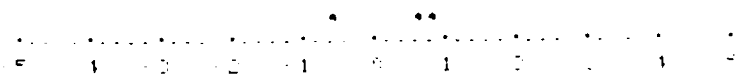
APPROXIMATE CHANGE IN SCRAP AND REWORK COSTS FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = $-18.3K
STD. DEV. = $20.0K
MIN. OBS. = $-47.4K
MAX. OBS. = $-2.0K

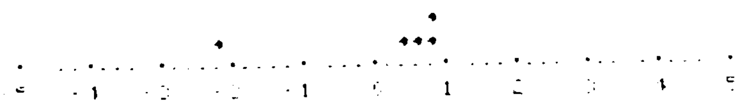
OTHER AEROSPACE

NO. OBS. = 3
MEAN = $-8.8K
STD. DEV. = $15.0K
MIN. OBS. = $-26.2K
MAX. OBS. = $0



OTHER INDUSTRY

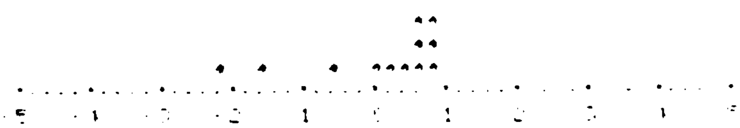
NO. OBS. = 5
MEAN = $-13.8K
STD. DEV. = $25.1K
MIN. OBS. = $-58.5K
MAX. OBS. = $0



ALL RESPONSES

NO. OBS. = 12
MIN. OBS. = $-58.5K
MAX. OBS. = $0

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $14.1K STD. DEV. = $19.8K

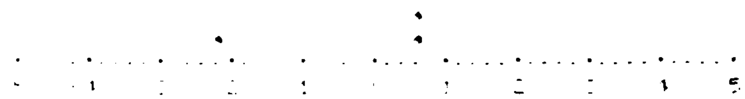
APPROXIMATE CHANGE IN SCRAP AND REWORK COSTS FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	$-29.5K
STD. DEV.	=	$37.9K
MIN. OBS.	=	$-84.8K
MAX. OBS.	=	$-1.3K

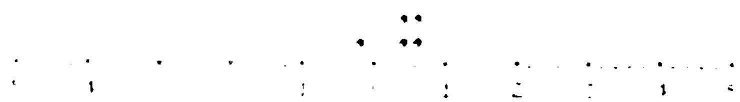
OTHER AEROSPACE

NO. OBS.	=	3
MEAN	=	$-32.5K
STD. DEV.	=	$55.3K
MIN. OBS.	=	$-96.6K
MAX. OBS.	=	$-1.7K



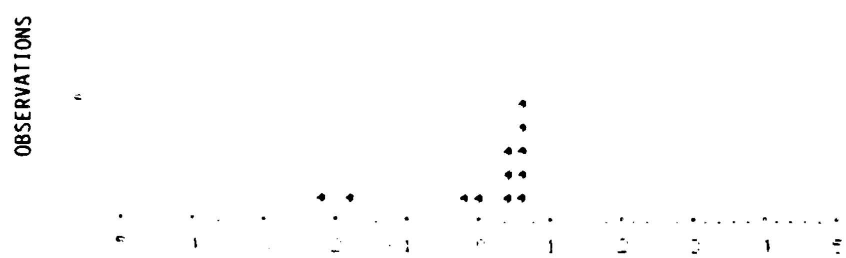
OTHER INDUSTRY

NO. OBS.	=	5
MEAN	=	$-8.3K
STD. DEV.	=	$10.2K
MIN. OBS.	=	$-25.0K
MAX. OBS.	=	$0



ALL RESPONSES

NO. OBS.	=	12
MIN. OBS.	=	$-96.6K
MAX. OBS.	=	$0



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $-21.5K STD. DEV = $33.5K

APPROXIMATE CHANGE IN WORK IN PROCESS INVENTORY FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

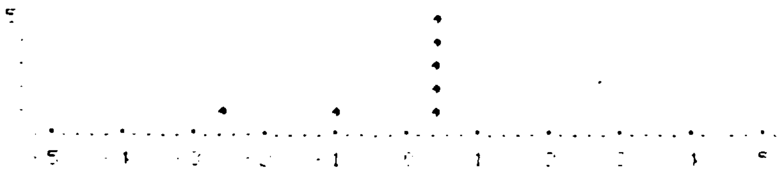
NO. OBS.	=	2
MEAN	=	$-16.3K
STD. DEV.	=	$ 23.0K
MIN. OBS.	=	$ -32K
MAX. OBS.	=	$0

OTHER AEROSPACE

NO. OBS.	=	1
MEAN	=	$0
STD. DEV.	=	$0
MIN. OBS.	=	$0
MAX. OBS.	=	$0

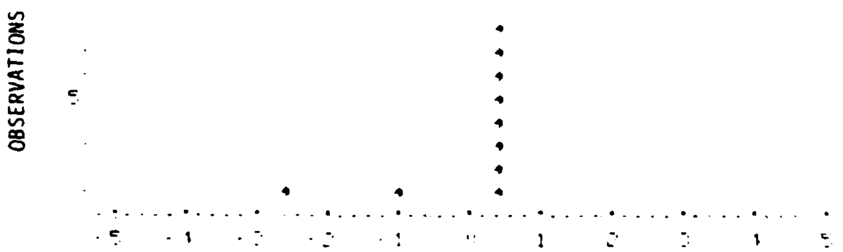
OTHER INDUSTRY

NO. OBS.	=	7
MEAN	=	$530.7K
STD. DEV.	=	$962.5K
MIN. OBS.	=	$-2500
MAX. OBS.	=	$0



ALL RESPONSES

NO. OBS.	=	10
MIN. OBS.	=	$-2500
MAX. OBS.	=	$0



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $-374.8K STD. DEV. = $925.0K

APPROXIMATE CHANGE IN WORK IN PROCESS INVENTORY FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

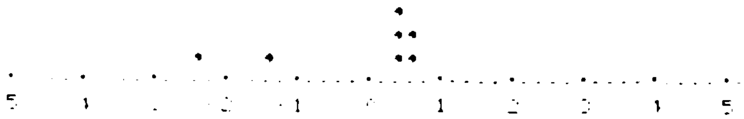
NO. OBS. = 2
MEAN = $ -15K
STD. DEV. = $-21.2K
MIN. OBS. = $-30.0K
MAX. OBS. = $ 0

OTHER AEROSPACE

NO. OBS. = 1
MEAN = $0
STD. DEV. = $0
MIN. OBS. = $0
MAX. OBS. = $0

OTHER INDUSTRY

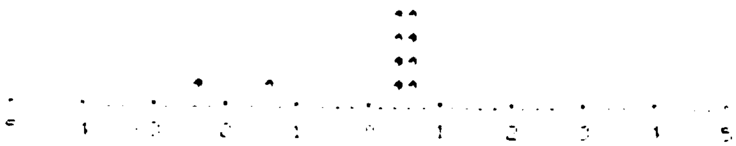
NO. OBS = 7
MEAN = $-260.1K
STD. DEV. = $ 403.5K
MIN. OBS. = $ -1000K
MAX. OBS. = $0



ALL RESPONSES

NO. OBS. = 10
MIN. OBS. = $-1000K
MAX. OBS. = $0

OBSERVATIONS

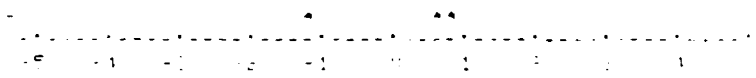


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = $-185.1K STD. DEV. = $351.0K

APPROXIMATE CHANGE IN PROCESS PLANNING COST FOR CYLINDRICAL PARTS -- SYSTEM 3

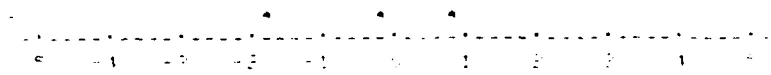
MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	$-718K
STD. DEV.	=	$1,103K
MIN. OBS.	=	$-1,991K
MAX. OBS.	=	$-45K



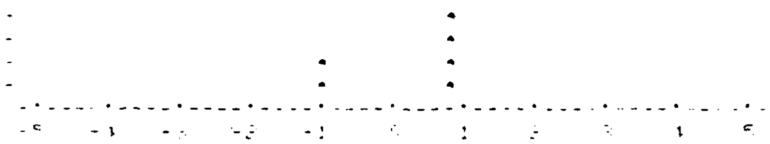
OTHER AEROSPACE

NO. OBS.	=	3
MEAN	=	$1,109K
STD. DEV.	=	$1,240K
MIN. OBS.	=	$-2,450K
MAX. OBS.	=	$-5K



OTHER INDUSTRY

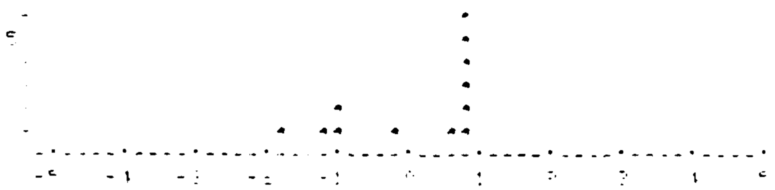
NO. OBS.	=	6
MEAN	=	$-607K
STD. DEV.	=	$ 904K
MIN. OBS.	=	$-1,794K
MAX. OBS.	=	$-8K



ALL RESPONSES

NO. OBS.	=	12
MIN. OBS.	=	$-2,450K
MAX. OBS.	=	$-5K

OBSERVATIONS



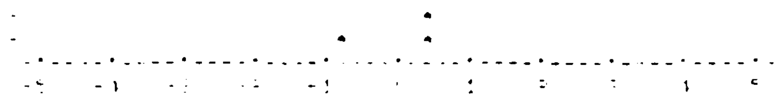
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $-638K STD. DEV. = $935K

APPROXIMATE CHANGE IN PROCESS PLANNING COST FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

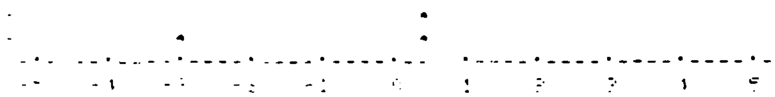
MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	$-1,244K
STD. DEV.	=	$2,007K
MIN. OBS.	=	$-3,562K
MAX. OBS.	=	$-90K



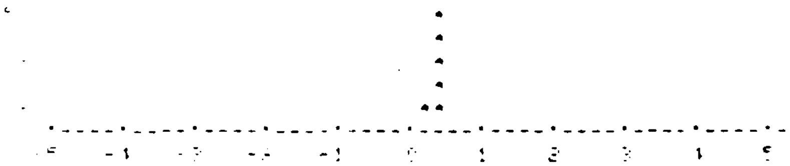
OTHER AEROSPACE

NO. OBS.	=	3
MEAN	=	$-3,126K
STD. DEV.	=	$5,104K
MIN. OBS.	=	$-9,016K
MAX. OBS.	=	$-15K



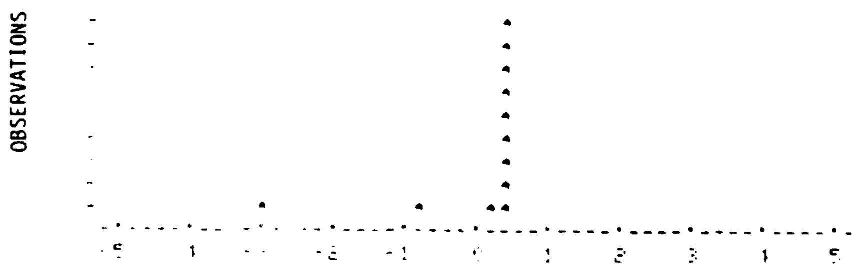
OTHER INDUSTRY

NO. OBS.	=	6
MEAN	=	$-188K
STD. DEV.	=	$ 259K
MIN. OBS.	=	$-700K
MAX. OBS.	=	$-9K



ALL RESPONSES

NO. OBS.	=	12
MIN. OBS.	=	$-9,016K
MAX. OBS.	=	$-9K



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $-1,187K STD. DEV. = $2,659K

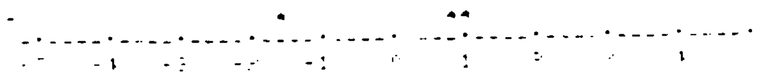
APPROXIMATE CHANGE IN MATERIAL COST FOR CYLINDRICAL PARTS -- SYSTEM 3

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = $ -18K
STD. DEV. = $ 14K
MIN. OBS. = $ -34K
MAX. OBS. = $ - 2K

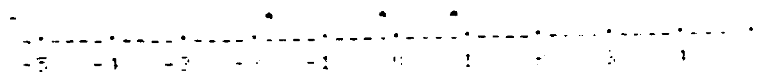
OTHER AEROSPACE

NO. OBS. = 3
MEAN = $ -25K
STD. DEV. = $ 34K
MIN. OBS. = $ -70K
MAX. OBS. = $ 0



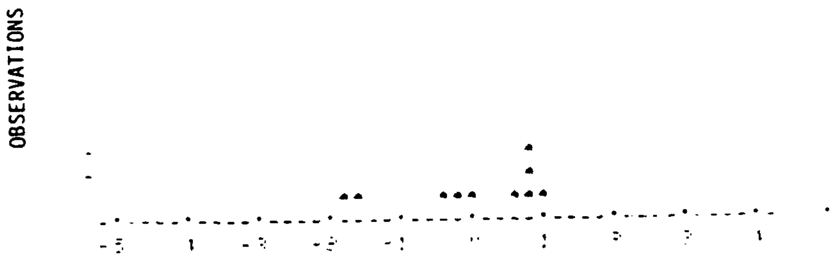
OTHER INDUSTRY

NO. OBS. = 3
MEAN = $ -36K
STD. DEV. = $ 34K
MIN. OBS. = $ -72K
MAX. OBS. = $ - 5K



ALL RESPONSES

NO. OBS. = 11
MIN. OBS. = $ -72K
MAX. OBS. = $ 0



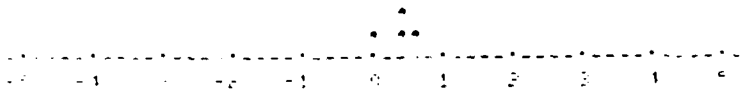
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $ - 25K STD. DEV. = $ 27K

APPROXIMATE CHANGE IN MATERIAL COST FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

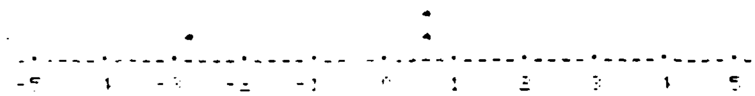
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	$ -22K
STD. DEV.	=	$ 17K
MIN. OBS.	=	$ -42K
MAX. OBS.	=	$ -1K



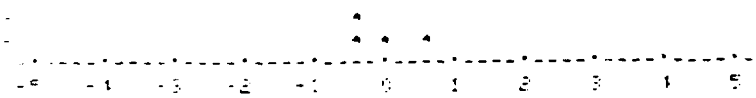
OTHER AEROSPACE

NO. OBS.	=	3
MEAN	=	$ -84K
STD. DEV.	=	$ 145K
MIN. OBS.	=	$-252K
MAX. OBS.	=	$ 0



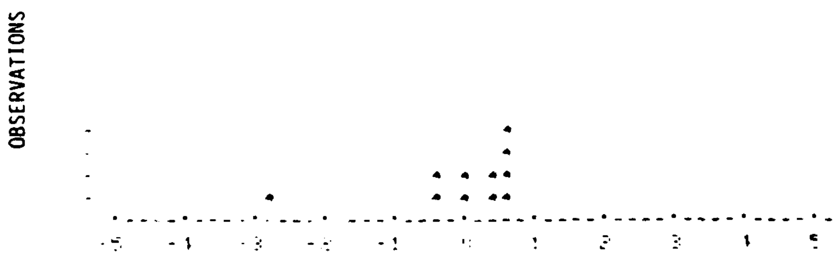
OTHER INDUSTRY

NO. OBS.	=	4
MEAN	=	$ -50K
STD. DEV.	=	$ 37K
MIN. OBS.	=	$ -84K
MAX. OBS.	=	$ 0K



ALL RESPONSES

NO. OBS.	=	11
MIN. OBS.	=	$-252K
MAX. OBS.	=	$ 0



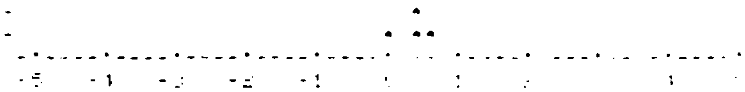
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $-47K STD. DEV. = $73K

APPROXIMATE CHANGE IN DIRECT LABOR COST FOR CYLINDRICAL PARTS -- SYSTEM 3

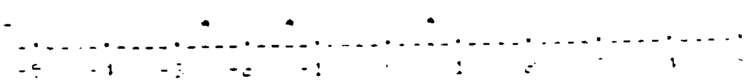
<u>MISSILE PRIMES & SUBS</u>

NO. OBS.	=	4
MEAN	=	$-122K
STD. DEV.	=	$ 115K
MIN. OBS.	=	$-284K
MAX. OBS.	=	$- 20K



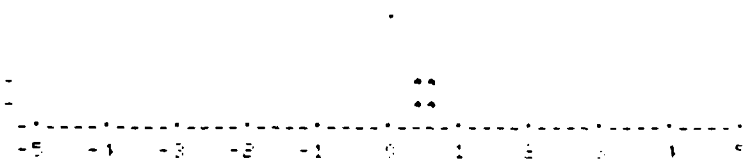
<u>OTHER AEROSPACE</u>

NO. OBS.	=	3
MEAN	=	$-869K
STD. DEV.	=	$ 786K
MIN. OBS.	=	$-1595K
MAX. OBS.	=	$ -33K



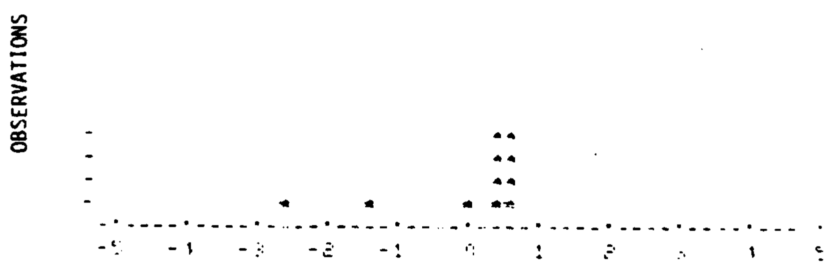
<u>OTHER INDUSTRY</u>

NO. OBS.	=	4
MEAN	=	$ -30K
STD. DEV.	=	$ 32K
MIN. OBS.	=	$ -72K
MAX. OBS.	=	$ 0



<u>ALL RESPONSES</u>

NO. OBS.	=	11
MIN. OBS.	=	$-1,595K
MAX. OBS.	=	$ 0



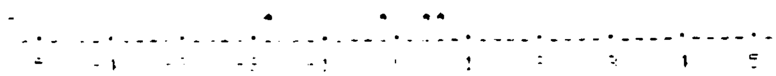
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $-292K STD. DEV. = $516K

APPROXIMATE CHANGE IN DIRECT LABOR COST FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

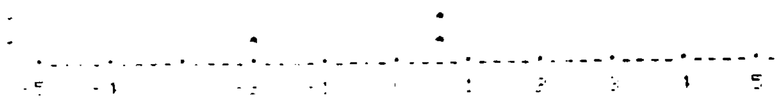
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	$-233K
STD. DEV.	=	$ 283K
MIN. OBS.	=	$-636K
MAX. OBS.	=	$ -14K



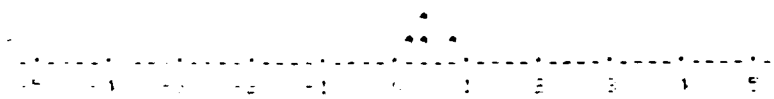
OTHER AEROSPACE

NO. OBS.	=	3
MEAN	=	$-243K
STD. DEV.	=	$ 365K
MIN. OBS.	=	$-665K
MAX. OBS.	=	$ -28K



OTHER INDUSTRY

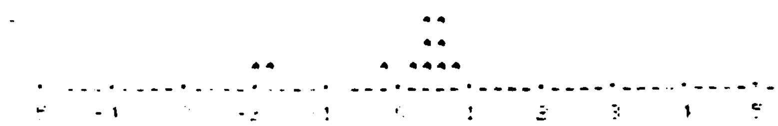
NO. OBS.	=	4
MEAN	=	$ -71K
STD. DEV.	=	$ 50K
MIN. OBS.	=	$-117K
MAX. OBS.	=	$ 0



ALL RESPONSES

NO. OBS.	=	11
MIN. OBS.	=	$-665K
MAX. OBS.	=	$ 0

OBSERVATIONS



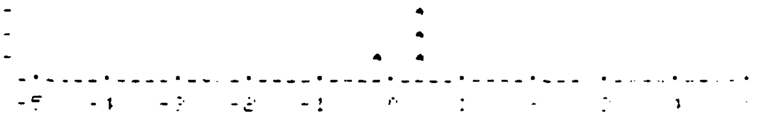
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $-156K STD. DEV. = $258K

APPROXIMATE CHANGE IN TOOLING COST FOR CYLINDRICAL PARTS -- SYSTEM 3

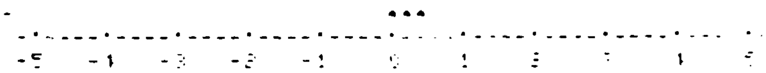
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	$-112K
STD. DEV.	=	$ 179K
MIN. OBS.	=	$-379K
MAX. OBS.	=	$ -1K



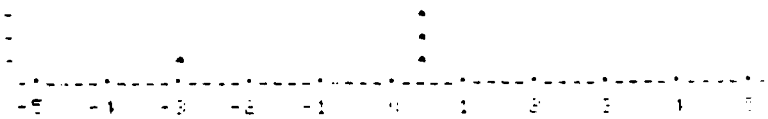
OTHER AEROSPACE

NO. OBS.	=	3
MEAN	=	$-114K
STD. DEV.	=	$ 108K
MIN. OBS.	=	$-216K
MAX. OBS.	=	$ 0



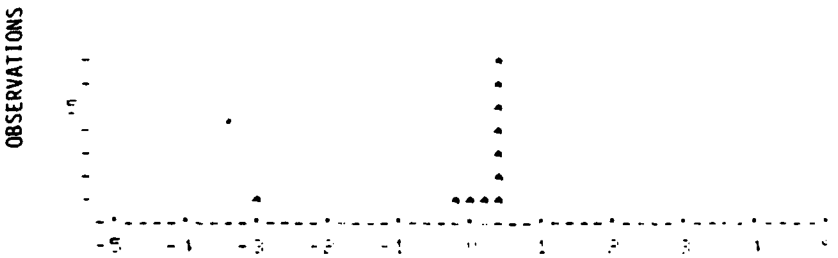
OTHER INDUSTRY

NO. OBS.	=	4
MEAN	=	$ 520K
STD. DEV.	=	$1,018K
MIN. OBS.	=	$-2,047K
MAX. OBS.	=	$ -2K



ALL RESPONSES

NO. OBS.	=	11
MIN. OBS.	=	$-2,047K
MAX. OBS.	=	$ 0



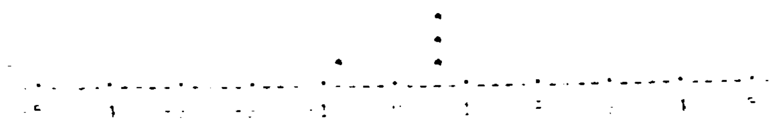
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $-261K STD. DEV. = $604K

APPROXIMATE CHANGE IN TOOLING COST FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

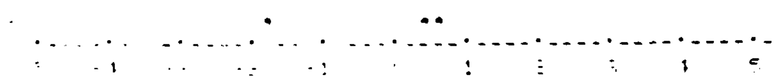
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	$-144K
STD. DEV.	=	$ 244K
MIN. OBS.	=	$-509K
MAX. OBS.	=	$ -1K



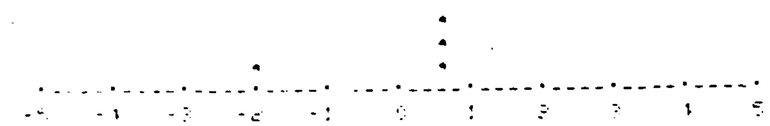
OTHER AEROSPACE

NO. OBS.	=	3
MEAN	=	$-285K
STD. DEV.	=	$ 451K
MIN. OBS.	=	$-805K
MAX. OBS.	=	$ 0



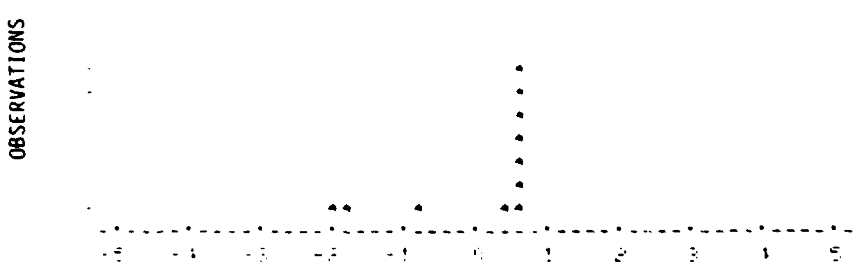
OTHER INDUSTRY

NO. OBS.	=	4
MEAN	=	$-234K
STD. DEV.	=	$ 428K
MIN. OBS.	=	$-875K
MAX. OBS.	=	$ -17K



ALL RESPONSES

NO. OBS.	=	11
MIN. OBS.	=	$-875K
MAX. OBS.	=	$ 0



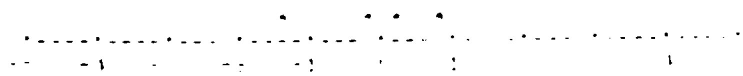
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $-215K STD. DEV. = $342K

APPROXIMATE CHANGE IN SCRAP AND REWORK COSTS FOR CYLINDRICAL PARTS -- SYSTEM 3

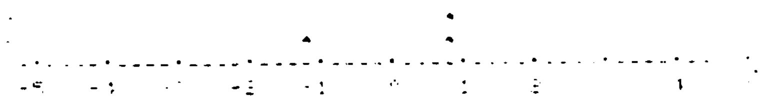
MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	$ -22K
STD. DEV.	=	$ 19K
MIN. OBS.	=	$ -47K
MAX. OBS.	=	$ -2K



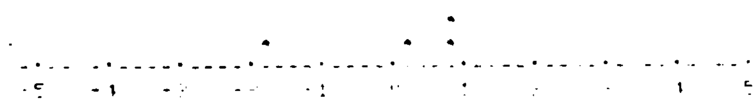
OTHER AEROSPACE

NO. OBS.	=	3
MEAN	=	$ -15K
STD. DEV.	=	$ 25K
MIN. OBS.	=	$ -44K
MAX. OBS.	=	$ 0



OTHER INDUSTRY

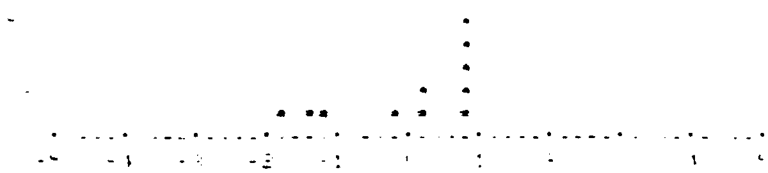
NO. OBS.	=	4
MEAN	=	$ -19K
STD. DEV.	=	$ 27K
MIN. OBS.	=	$ -59K
MAX. OBS.	=	$ 0



ALL RESPONSES

NO. OBS.	=	11
MIN. OBS.	=	$ -59K
MAX. OBS.	=	$ 0

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $-19K STD. DEV. = $22K

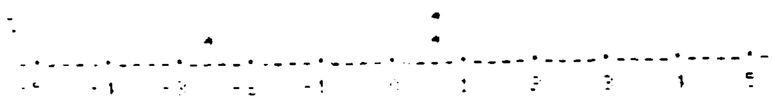
APPROXIMATE CHANGE IN SCRAP AND REWORK COSTS FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

MISSILE PRIMES & SUBS

NO. OBS.	=	4
MEAN	=	$ -36K
STD. DEV.	=	$ 38K
MIN. OBS.	=	$ -85K
MAX. OBS.	=	$-1.3K

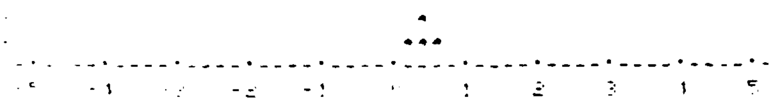
OTHER AEROSPACE

NO. OBS.	=	3
MEAN	=	$ -54K
STD. DEV.	=	$ 93K
MIN. OBS.	=	$-161K
MAX. OBS.	=	$ 0



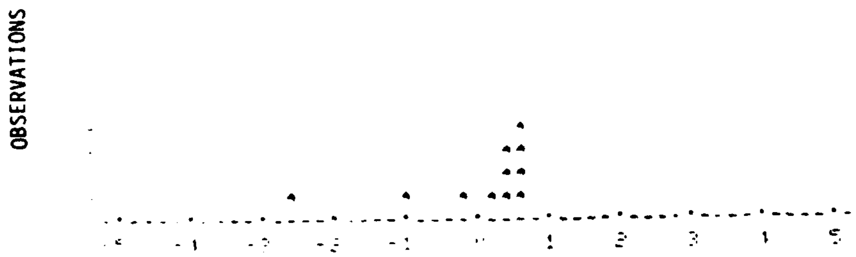
OTHER INDUSTRY

NO. OBS.	=	4
MEAN	=	$ -13K
STD. DEV.	=	$ 10K
MIN. OBS.	=	$ -25K
MAX. OBS.	=	$ -2K



ALL RESPONSES

NO. OBS.	=	11
MIN. OBS.	=	$-161K
MAX. OBS.	=	$ 0



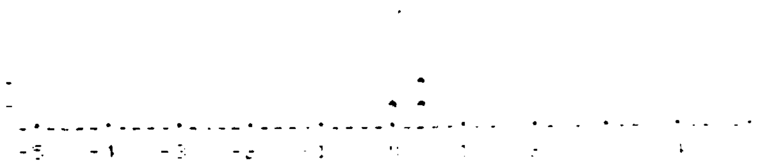
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $-32K STD. DEV. = $50K

APPROXIMATE CHANGE IN WORK IN PROCESS INVENTORY FOR CYLINDRICAL PARTS -- SYSTEM 3

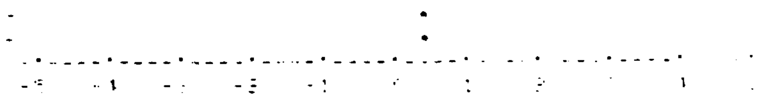
MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	$-149K
STD. DEV.	=	$ 219K
MIN. OBS.	=	$-400K
MAX. OBS.	=	$ 0



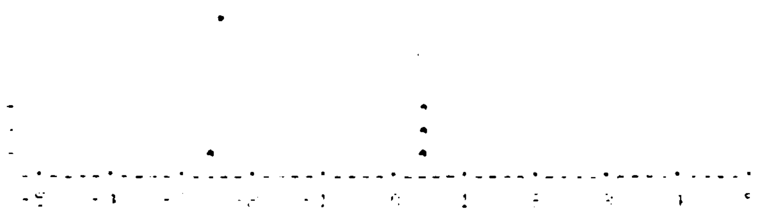
OTHER AEROSPACE

NO. OBS.	=	2
MEAN	=	$-12.4K
STD. DEV.	=	$ 17.7K
MIN. OBS.	=	$ -25K
MAX. OBS.	=	$ 0



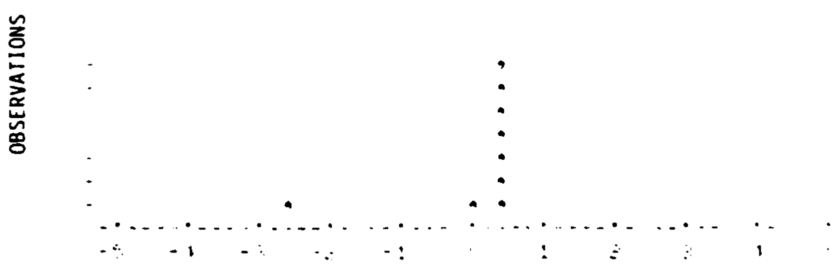
OTHER INDUSTRY

NO. OBS.	=	4
MEAN	=	$-648K
STD. DEV.	=	$1,235K
MIN. OBS.	=	$-2,500K
MAX. OBS.	=	$ -20K



ALL RESPONSES

NO. OBS.	=	9
MIN. OBS.	=	$-2,500K
MAX. OBS.	=	$ 0



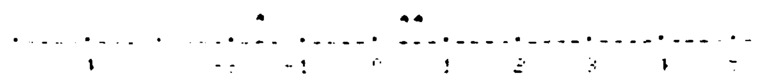
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $-340K STD. DEV. = $820K

APPROXIMATE CHANGE IN WORK IN PROCESS INVENTORY FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

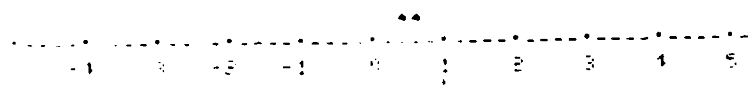
MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	$ -28K
STD. DEV.	=	$ 450K
MIN. OBS.	=	$-800K
MAX. OBS.	=	$ 0



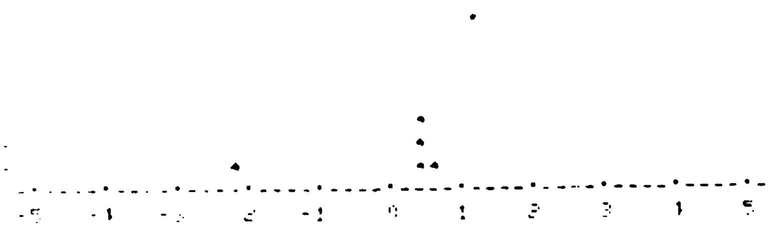
OTHER AEROSPACE

NO. OBS.	=	2
MEAN	=	$ -30K
STD. DEV.	=	$ 42K
MIN. OBS.	=	$ -60K
MAX. OBS.	=	$ 0



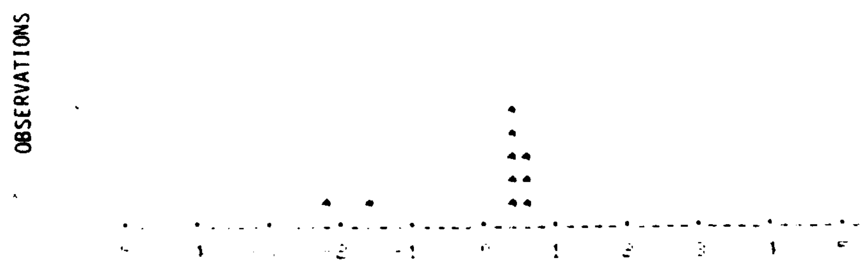
OTHER INDUSTRY

NO. OBS.	=	5
MEAN	=	$-235K
STD. DEV.	=	$ 429K
MIN. OBS.	=	$-1,000K
MAX. OBS.	=	$ 0



ALL RESPONSES

NO. OBS.	=	10
MIN. OBS.	=	$-1,000K
MAX. OBS.	=	$ 0



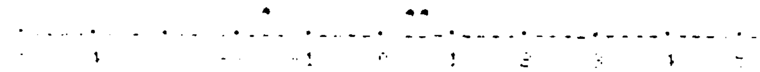
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $-207K STD. DEV. = $369K

APPROXIMATE CHANGE IN WORK IN PROCESS INVENTORY FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

MISSILE PRIMES & SUBS

NO. OBS.	=	3
MEAN	=	$ -28K
STD. DEV.	=	$ 450K
MIN. OBS.	=	$-800K
MAX. OBS.	=	$ 0

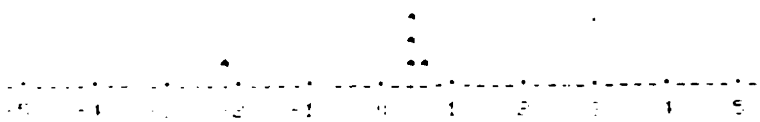


OTHER AEROSPACE

NO. OBS.	=	2
MEAN	=	$ -30K
STD. DEV.	=	$ 42K
MIN. OBS.	=	$ -60K
MAX. OBS.	=	$ 0

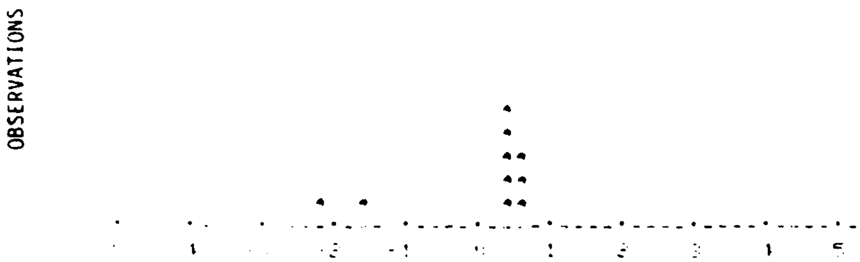
OTHER INDUSTRY

NO. OBS.	=	5
MEAN	=	$-235K
STD. DEV.	=	$ 429K
MIN. OBS.	=	$-1,000K
MAX. OBS.	=	$ 0



ALL RESPONSES

NO. OBS.	=	10
MIN. OBS.	=	$-1,000K
MAX. OBS.	=	$ 0



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = $-207K STD. DEV. = $369K

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